55-4920-244-14

TECHNICAL MANUAL

OPERATOR'S ORGANIZATIONAL, DS AND GS MAINTENANCE MANUAL INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST FOR TESTER, EXHAUST GAS TEMPERATURE MODEL BH112JA-36 (FSN 4920-673-5514)

This copy is a reprint which includes current pages from Changes 1 through 3

This manual superseded TM 55-4920-244-15, 23 February 1965, including all changes.

HEADQUARTERS, DEPARTMENT OF THE ARMY

28 February 1974

READEX FICHE best copy available

D 101.11:

WARNING

Personnel performing operations, procedures, and practices which are included or implied in this technical manual shall observe the following warnings. Disregard of these warnings and precautionary information can cause serious injury, death, or destruction of material.

Ground the tester with the pigtail ground wire in the power inlet cable before using the tester.

Use trichloroethylene only in an adequately ventilated area. Avoid prolonged or repeated breathing of vapor. Avoid prolonged or repeated contact with the skin.

Stop operation immediately if a defect is noted that could cause damage to the tester by continuing operation.

Never use an ohmmeter or voltmeter to check the potentiometer circuit for continuity as damage to the galvanometer (GALVO-1) will result.

Detonate explosives from a safe distance. Keep blasting caps, detonating cords, and safety fuses separated from the explosive charges until required for use.

Do not tow the tester behind a vehicle, use as a step, or place it under aircraft dump valve.

TM 55-4920-244-14
C 3

CHANGE NO. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 28 September 1985

Operator's Organizational, DS and GS Maintenance Manual
Including Repair Parts and Special Tools List
for

TESTER, EXHAUST GAS TEMPERATURE
MODEL BH112JA-36
(NSN 4920-00-673-5514)

TM 55-4920-244-14, 28 February 1974, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
1-1 and 1-2	1-1 and 1-2
2-5 and 2-6	2-5 and 2-6
2-11 and 2-12	2-11 and 2-12

2. Retain this sheet in front of manual for reference purposes.

By Order of the Secretary of the Army:

JOHN H. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

DONALD J. DELANDRO
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, Operator, AVUM and AVIM Maintenance Requirements for All Rotary Wing Aircraft and All Fixed Wing Aircraft.

TM 55-4920-244-14
C 2

CHANGE
No. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *12 June 1981*

OPERATOR'S ORGANIZATIONAL, DS AND GS MAINTENANCE MANUAL
INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST
FOR

TESTER, EXHAUST GAS TEMPERATURE
MODEL BH112JA-36
(FSN 4920-673-5514)

TM 55-4920-244-14, 28 February 1974, is changed as follows:

1. Remove and insert pages as indicated below.

	Remove pages	Insert pages
Table of Contents	i	i
Chapter 1	1-1 and 1-2	1-1 and 1-2
Chapter 2	2-7 and 2-8	2-7 and 2-8
	2-15	2-15
Chapter 3	3-5 and 3-6	3-5 and 3-6
Appendix A	A-1	A-1

2. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

3. Retain this sheet in front of manual for reference purposes.

By Order of the Secretary of the Army:

E. C. MEYER
General, United States Army
Chief of Staff

Official:

J. C. PENNINGTON
Major General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, Operator Maintenance Requirements for all Fixed and Rotor Wing Aircraft.

TM 55-4920-244-14
C 1

CHANGE
No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC., 25 July 1975

Operator's Organizational, DS and GS
Maintenance Manual
Including Repair Parts and Special Tools List

FOR

TESTER, EXHAUST GAS TEMPERATURE
MODEL BH112JA-36
(FSN 4920-673-5514)

TM 55-4920-244-14, 28 February 1974, is changed as follows:

1. Remove and insert pages as indicated below.

	Remove pages	Insert pages
Chapter 4, section II	4-3 thru 4-6	4-3
	4-7 thru 4-10	4-7 thru 4-10
section IV	4-31 and 4-32	4-31 and 4-32
	4-33 and 4-34	4-34
section IV - V	4-35 thru 4-38	4-35 thru 4-38
	4-47 thru 4-49	4-47 thru 4-49

2. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

3. Retain this sheet in front of manual for reference purposes.

By Order of the Secretary of the Army:

FRED C. WEYAND
General, United States Army
Chief of Staff

Official:
VERNE L. BOWERS
Major General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31 (qty rqr block no. 322) Organizational Maintenance requirements for All Fixed and Rotor Wing aircraft.

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistake or if you know of any way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, US Army Troop Support and Aviation Materiel Readiness Command, ATTN: DRSTS-MTT, 4300 Goodfellow Blvd., St. Louis, MO 63120. A reply will be furnished directly to you.

TABLE OF CONTENTS

Chapter/Section			Page
LIST OF ILLUSTRATIONS			1-1
CHAPTER	1.	INTRODUCTION	1-1
Section	I.	General	1-1
	II.	Description	1-1
	III.	Test Equipment and Special Tools	1-3
CHAPTER	2.	OPERATING INSTRUCTIONS	2-1
Section	I.	Controls and Instruments	2-1
	I.	Operation Under Usual Conditions	2-3
	III.	Operation Under Unusual Conditions	2-14
CHAPTER	3.	ORGANIZATIONAL MAINTENANCE INSTRUCTIONS	3-1
Section	I.	Preparation for Installation, Storage and Shipment	3-1
	II.	Installation	3-1
	III.	Inspections and Servicing	3-2
	IV.	Preventive Maintenance	3-5
	V.	Operational Checkout of Tester and Accessories	3-6
CHAPTER	4.	DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE INSTRUCTIONS	4-1
Section	I.	Preparation for Maintenance Storage and Reshipment	4-1
	II.	Checkout and Analysis	4-3
	III.	Repair Procedures	4-10
	IV.	Reassembly and Alignment	4-31
	V.	Alpha-Numeric Parts List and Probe Reference Table	4-38
APPENDIX	A.	REFERENCES	A-1
	B.	MAINTENANCE ALLOCATION CHART	B-1
	C.	REPAIR PARTS AND SPECIAL TOOLS LIST	C-1
Section	I.	Introduction	C-1
	II.	Repair Parts List	C-4
	III.	Special Tools List (Not Applicable)	C-9
	IV.	FSN, Reference Number Index	C-10

LIST OF ILLUSTRATIONS

Number	Title	Page
1-1	Exhaust Gas Temperature Tester	1-2
2-1	Operator's Controls and Instruments	2-2
2-2	EGT Circuit Check	2-4
2-3	Installation of Heater Probes in Engine (sheet 1 of 2)	2-5
2-3	Installation of Heater Probes in Engine (sheet 2 of 2)	2-6
2-4	EGT Indicator Check	2-7
2-5	Resistance Check	2-8
2-6	Insulation Resistance Check	2-9
2-7	Continuity Probe and Sampling Thermocouple	2-10
2-8	Operational Check	2-12
2-9	Thermocouple Bench Check	2-13
2-10	Cable Storage Compartment	2-15
3-1	Box Assembly	3-3
3-2	Probe Storage Compartment	3-4
3-3	Heater Probe Circuit Operation Check	3-7
3-4	Check Cable Circuit Continuity Check	3-8
3-5	EGT Indicator Circuit Operation Check	3-9
4-1	Shipping Pallet	4-3
4-2	Connections for Potentiometer Circuit Checkout Using Circuit Tester, Part No. BH161A-2	4-5
4-3	Connections for RPM Check Circuit Checkout Using Circuit Tester, Part No. BH161A-2	4-5
4-4	Insulation Check Circuit Test	4-6
4-5	Resistance Check Circuit Test	4-7
4-6	Tester Major Components	4-12
4-7	BH1766 Circuit Board Assembly (sheet 1 of 2)	4-14
4-7	BH1766 Circuit Board Assembly (sheet 2 of 2)	4-15
4-8	Deck Assembly (sheet 1 of 4)	4-16
4-8	Deck Assembly (sheet 2 of 4)	4-17
4-8	Deck Assembly (sheet 3 of 4)	4-18
4-8	Deck Assembly (sheet 4 of 4)	4-20
4-9	BH146 Takcal Assembly (sheet 1 of 2)	4-24
4-9	BH146 Takcal Assembly (sheet 2 of 2)	4-25
4-10	BH1760 Printed Circuit Board Assembly	4-32
4-11	BH1760 Circuit Board Assembly Trimpot Locations	4-32
4-12	Terminal Locations, Potentiometer °C	4-35
4-13	Terminal Board Assemblies	4-37
4-14	RPM Check Assembly Trimpot Location	4-38
4-15	Schematic Diagram	4-39

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1. SCOPE.

a. General. These instructions are published for the use of personnel who operate the exhaust gas temperature tester, part number BH112JA-36, and for personnel responsible for organizational, direct support, and general support of the tester. The instructions provide information on the description, operation, maintenance, shipment, storage, and demolition of the tester.

b. Appendix A. Appendix A provides a standard list of all publications applicable to this manual and available to the operator and maintenance personnel.

c. Appendix B. Appendix B contains the Maintenance Allocation Chart. The chart assigns to the lowest appropriate echelon the maintenance functions and repair operations to be performed.

d. Appendix C. Appendix C contains Repair Parts and Special Tools.

e. Recommendations. Report of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028, Recommended Changes to Publications, and forwarded direct to Commander, U.S. Army Aviation Systems Command, Attn: AMSAV-MPSD, 4300 Goodfellow Blvd., St. Louis, Missouri 63120-1798.

1-2. RECORD AND REPORT FORMS.

The following record and report forms are used by the operator and maintenance personnel for recording and reporting operations and maintenance activities. For instructions as to the use of listed forms, refer to TM 38-750.

a. DA Form 2402, Exchange Tag

b. DA Form 2404, Equipment Inspection and Maintenance Worksheet

c. DA Form 2405, Maintenance Request Register

d. DA Form 2406, Material Readiness Report

e. DA Form 2407, Maintenance Request

f. DA Form 2409, Equipment Maintenance Log (Consolidated)

g. DD Form 314, Preventive Maintenance Schedule and Record

Section II. DESCRIPTION AND DATA

1-3. DESCRIPTION.

The exhaust gas temperature tester (fig 1-1) is used to determine the accuracy of the aircraft exhaust gas temperature (egt) system without running the engine and to read engine rpm and egt accurately during engine run. The major components of the tester are the exhaust gas temperature indicator; resistance, insulation, and rpm check circuit; potentiometer; voltage regulator; meters; switches; and the the necessary probes, cables, and adapters for performing all tests. Storage is provided within the tester for all probes, cables, and adapters. The tester operates on any 95 to 135 volts, 50 to 400 Hertz, ac power source in temperatures ranging from −54° to +71° Celsius (−65° to +160° Fahrenheit).

1-4. IDENTIFICATION.

a. Nameplate. The tester nameplate is located on the outside of the probe storage compartment between the latches. The nameplate identifies the tester by name, manufacturer's part number and serial number, and Federal Stock Number.

b. Instruction Plate. The instruction plate is mounted on the bottom of the probe storage compartment, and gives the step-by-step operating instructions for the tester.

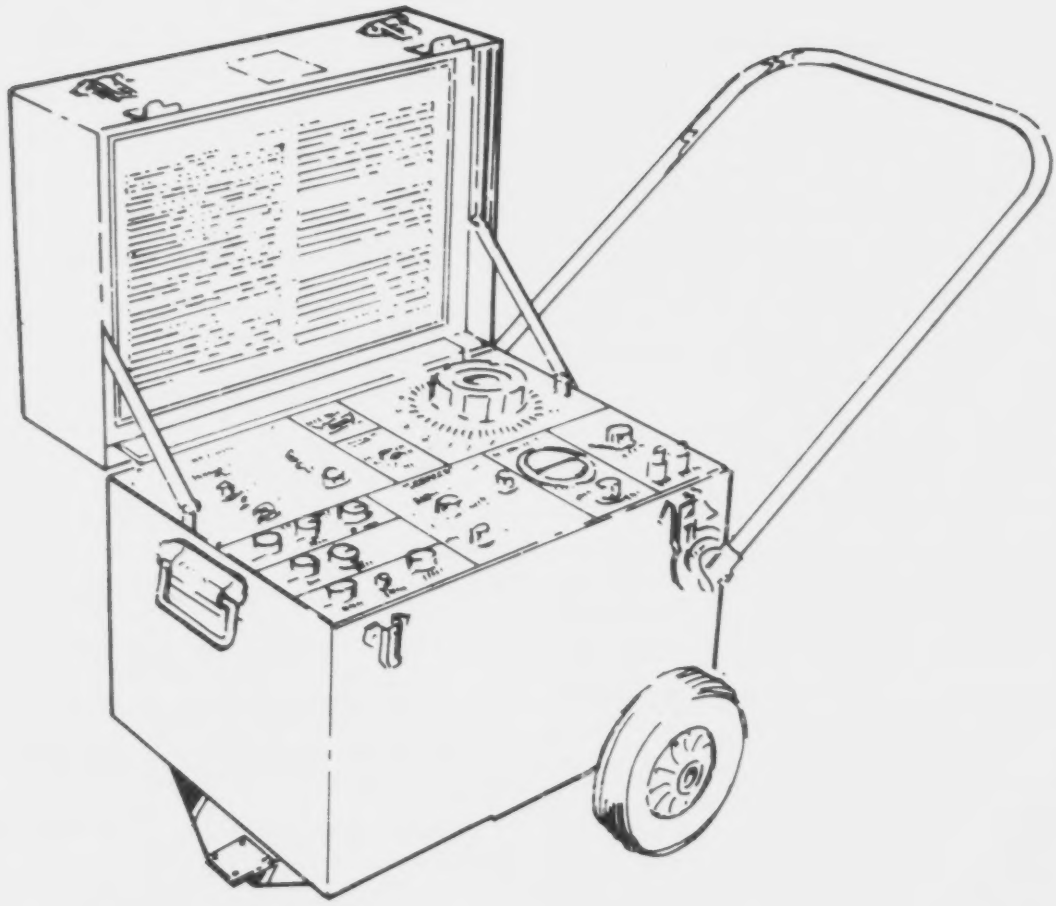


Figure 1-1. Exhaust gas temperature tester.

c. Wiring Diagram Plate. The wiring diagram plate is mounted on the bottom of the lid of the probe storage compartment, and gives a complete wiring diagram of the tester.

1-5. DIFFERENCES IN MODELS.

This manual covers only the exhaust gas temperature tester, part number BH112JA-36.

1-6. TABULATED DATA.

a. General:

Manufacturer	Howell Instruments, Inc.
Model	BH112JA-36
Weight (without probes and accessories)	110 lbs (approx)
Power Requirements	95 to 135 volts, 50 to 400 Hertz
Fuses	one 2 amp, one amp (external); one 1 amp (internal)

b. Overall Dimensions

Length.....25–1/2 inches

Width.....22 inches

Height.....23 inches

c. Operating Conditions

Operating temperature limits.....–54° to +71° Celsius (–65 to +160 °Fahrenheit)

Section III. TEST EQUIPMENT AND SPECIAL TOOLS

1–7. Special Tools and Equipment.

No special tools or test equipment required.

Table 1–1. Consumable materials.

Item Number		Federal or Military Specification
1	dry cleaning solvent	P–D–680
2	trichloroethylene	SO–T–634
3	abrasive paper	P–P–101
4	zinc chromate primer	TT–P–600
5	sealing compound	MIL–S–11030D
6	silver solder	QQ–B–654
7	rosin flux	MIL–F–20329
8	rosin core solder	QQ–S–571
9	oil	MIL–L–7870
10	grease	MIL–G–81322
11	desiccant	MIL–D–3464
12	indicator	MIL–I–8835
13	tape	PPP–T–60

Table 1–1. Consumable Materials—Continued

CHAPTER 2

OPERATING INSTRUCTIONS

Section 1. CONTROLS AND INSTRUMENTS

2-1. General.

This section describes, locates, and furnishes the operator sufficient information pertaining to the various controls and instruments provided for the proper operation of the tester.

WARNING

Careless operation or improper setting of the controls will cause damage to the tester. For this reason, it is important that the operator know the function of every control and instrument.

Controls and instruments necessary for operation of the tester are located in the instrument compartment (fig. 1-1) beneath the probe storage compartment.

2-2. Operator's Controls (Figure 2-1).

a. Temperature Regulator Knob. The temperature regulator knob (4) is used to adjust a brush-type variable voltage regulator. The voltage regulator has a 20-ampere capacity and a maximum voltage output of approximately 130 percent of the input voltage.

b. Switch SW-8. Switch SW-8 (9) is a ratio selector switch used when making an insulation check.

c. Temperature Selector Knob. The temperature selector knob (10) is used to zero the galvanometer (12) when heating heater probes.

d. Mechanical Zero Knob. The mechanical zero knob (13) is used to mechanically zero the galvanometer (12), when switch SW-6 is in MECH. ZERO position.

e. Switch SW-6. Switch SW-6 (14) is a two-position switch. It is placed in MECH. ZERO position when mechanically zeroing galvanometer (12) and in RANGE position when taking temperature readings.

f. Switch SW-2. Switch SW-2 (16) connects either the heater cable (heater probe thermocouples) or the check cable (engine thermocouples) into the potentiometer circuit.

g. Switch SW-3. Switch SW-3 (19) is used to place the proper aircraft circuit resistance in the bridge circuit when performing the resistance test or adjusting the resistance of the engine thermocouple harness.

h. Switch SW-4. Switch SW-4 (21) is used to place the resistance matching the aircraft egt indicator into the test circuit.

i. Potentiometer R-1. Potentiometer R-1 (22) is a variable resistor used to zero the galvanometer (12) during the egt indicator check.

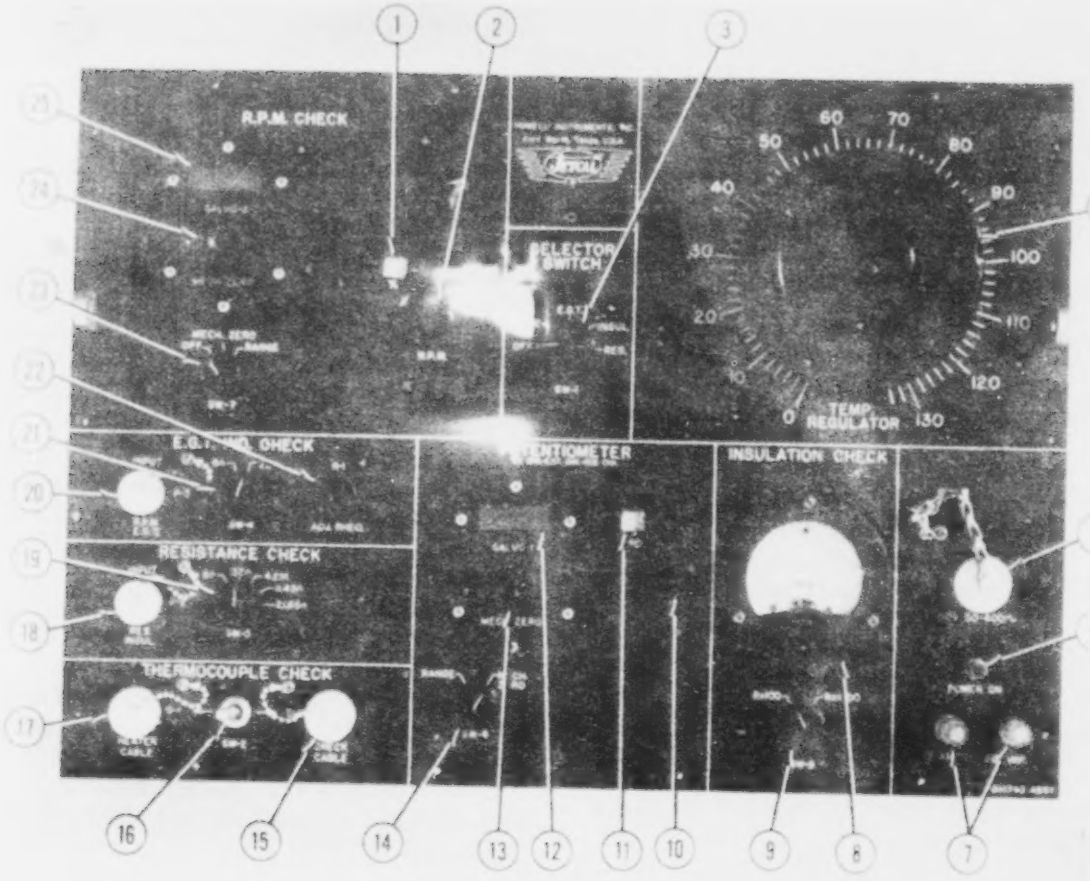
j. Switch SW-7. Switch SW-7 (23) is a three-position switch, marked OFF, MECH. ZERO, and RANGE. The OFF position shuts off the power to the R.P.M. CHECK circuit, the MECH. ZERO position is used when mechanically zeroing the galvanometer (25), and the RANGE position is used when taking an RPM reading.

k. Mechanical Zero Knob. The mechanical zero knob (24) is used to mechanically zero the galvanometer (25) when switch SW-7 is in MECH. ZERO position.

l. RPM KNOB. The RPM knob (2) is used to adjust the percent scale of the R.P.M. CHECK circuit to the percent RPM signal output of the engine tachometer generator.

m. Switch SW-1. Switch SW-1 (3) is a five-position switch used to select the proper circuit of the tester to make the T/C (thermocouple), E.G.T. (egt indicator, INSUL. (insulation), or RES. (Resistance) checks, and OFF (power still applied to heater probe circuit).

n. Switch SW-5. Switch SW-5 is located on the switch box (fig. 2-8). Switch SW-5 is a



Key to figure 2–1.

1. Percent Scale
2. RPM Knob
3. Switch SW–1
4. Temperature Regulator Knob
5. Connector P–1
6. Power On Light
7. Fuses
8. Insulation Checkmeter
9. Switch SW–8
10. Temperature Selector Knob
11. Degree Scale
12. Galvanometer
13. Mechanical Zero Knob
14. Switch SW–6
15. Connector
16. Switch SW–2
17. Connector
18. Connector P–2
19. Switch SW–3
20. Connector P–3
21. Switch SW–4
22. Potentiometer R–1
23. Switch SW–7
24. Mechanical Zero Knob
25. Galvanometer

Figure 2–1. Operator's controls and instruments.

two-position switch used to put the aircraft egt indicator in the circuit and to carry the indication of the engine thermocouple harness back to the tester.

2–3. Operator's Instruments (Figure 2–1).

a. Insulation Check Meter. The insulation check meter (8) indicates the resistance of the thermocouple circuit. The scale is calibrated from 0 to 500.

b. Degree Scale. The potentiometer is calibrated in degrees Celsius (in 1° increments) and is read on the °C scale (11).

c. Galvanometers. Galvanometer (12) is a light beam galvanometer used during all tests other than RPM and insulation checks . Galvanometer (25) is also a light beam galvanometer used during RPM checks.

d. Percent Scale. The % scale (1) shows the reading of the RPM check circuit. The percent scale is calibrated in increments of 0.2 percent from 0 to 110 percent RPM, and is read when switch SW–7 is in RANGE position.

Section II. OPERATION UNDER USUAL CONDITIONS

2–4. General.

a. This section provides instructions for normal testing operations and basic capabilities of the tester, as well as coordinating these capabilities to perform the specific tasks for which the tester is designed.

b. It is essential that the operator know how to perform every operation of which the tester is capable. Since nearly every testing assment presents a different problem, it may be necessary to vary the given test procedure to fit a specific testing assignment.

c. No special tools or equipment are needed by the operator to maintain or operate the tester.

2–5. Preparing the Tester for EGT Circuit Check (Figure 2–2).

NOTE

To check an engine not installed in an aircraft, follow the procedures listed below, except that the check cable must be connected to the engine junction box and the temperature of the engine thermocouple harness is read on the tester °C scale. Refer to engine manual for applicable check cable adapter.

a. Place switch SW–1 in OFF position.

b. Place TEMP REGULATOR knob in zero position.

WARNING

Ground the tester with the pigtail ground wire in the power inlet cable before using the tester.

c. Connect power inlet cable to connector P–1 and to a 110 volt, 50 to 400 Hertz, ac power source.

d. Connect heater cable to junction box and to tester at HEATER CABLE connector.

e. Connect one heater probe over each engine thermocouple in engine thermocouple harness.

f. As each heater probe is placed over engine thermocouple, connect it to junction box to keep cables straight on engine. Push heater probes completely on engine thermocouples and lock firmly in place.

2–6. EGT System Circuit Check (Figure 2–3).

CAUTION

If a heater probe fails or is defective before the start of a test, there is a possibility that the remaining heater probes can be burned out during increase of voltage regulator temperature. Check heater probes per paragraph 3–13.

a. With heater probes connected to engine thermocouples, place switch SW–1 in T/C position and switch SW–2 in S–1 position.

b. Place switch SW–6 in MECH. ZERO position and zero galvanometer by turning MECH. ZERO knob.

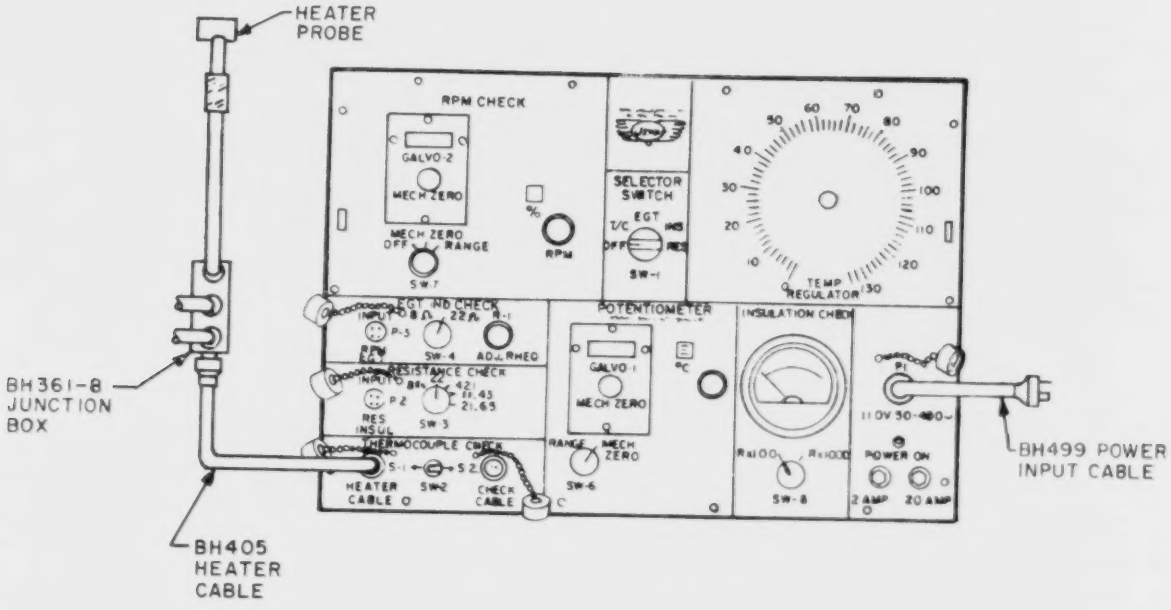


Figure 2–2. EGT circuit check.

c. Place switch SW–6 in RANGE position.

d. Perform temperature adjustments as outlined below.

NOTE

The following procedure will aid the operator in making rapid adjustments of the temperature of the heater probes and tester temperature readings. With practice the operator will be capable of making rapid adjustments of the heater probes.

(1) Turn TEMP. REGULATOR knob to maximum and allow heater probes to heat to test temperature.

(2) Adjust TEMP. REGULATOR knob back to allow temperature of heater probes to stabilize at test temperature (approximately 96 to 108 volts for 700° Celsius). Observe galvanometer for deflection and TEMP. REGULATOR knob for voltage setting.

(3) Turn TEMP. REULATOR knob well above or below voltage setting, according to galvanometer deflection, for a few seconds.

(4) Continue TEMP. REULATOR knob adjustments until heater probes are stabilized at test temperature.

NOTE

If testing in high wind or cold weather, it is advisable to place a cover over tail cone to reduce heat dissipation. A tail cone cover should always be used when testing engines equipped with sampling-type thermocouples to maintain true temperature over the entire length of thermocouple.

(5) With heater probes stabilized at engine test temperature, read °C scale and aircraft EGT indicator. Difference between these readings is indicated error of egt system and should not exceed applicable aircraft/engine technical manual tolerance.

(6) Place switch SW–6 in MECH. ZERO position.

(7) Return TEMP. REGULATOR knob to zero.

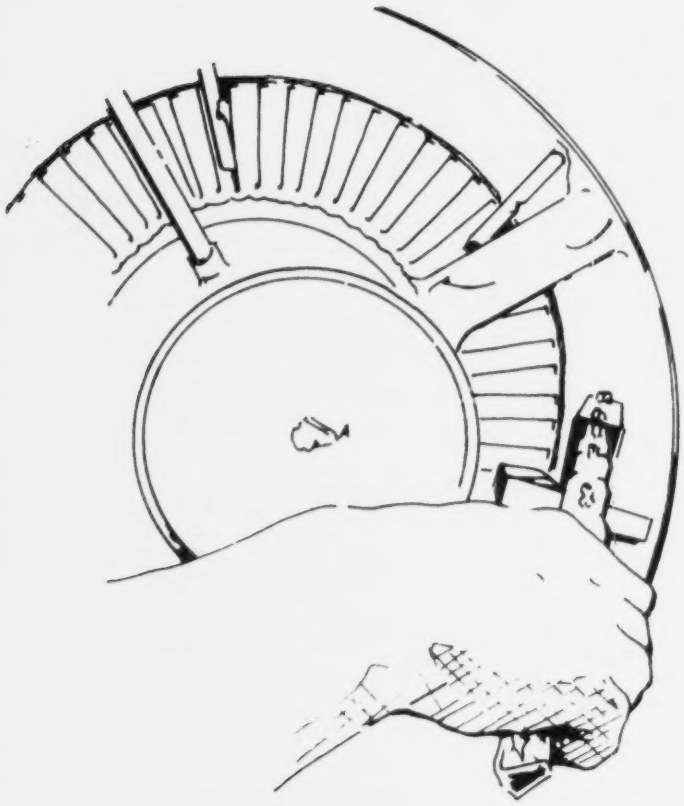


Figure 2-3. Installation of heater probes in engine (sheet 1 of 2).

(8) If system is within tolerances, secure tester in accordance with paragraph 2-14.

2-7. USING TESTER TO TROUBLESHOOT EGT SYSTEM.

If the egt system error exceeds applicable technical manual tolerance, one or more of the causes listed below will probably be the source of trouble. The complete egt system and all of its components must be correct before the egt system can be used for reliable exhaust gas temperature pickup. The possible sources of trouble are:

a. EGT indicator error (para. 2-8).

b. Resistance of circuit out of tolerance (para. 2-9).

c. Shorts to ground (para. 2-10).

d. Shorts between leads (para. 2-11).

e. One or more engine thermocouples inoperative in engine paralleling harness (para. 2-16).

f. Engine thermocouple harness errors (para. 2-15).

g. Transpositions (crossing of lead wires) (para. 2-13).

h. Engine thermocouples out of calibration (para. 2-16).

2-8. EGT INDICATOR CHECK (Figure 2-4).

a. Connect egt indicator check adapter to instrument cable and instrument cable to connector P-3.

b. Before removing EGT indicator from instrument panel, install slippage mark from indicator case to panel to insure correct reinstallation position. Adjust EGT indicator in normal operating position while in instrument panel.

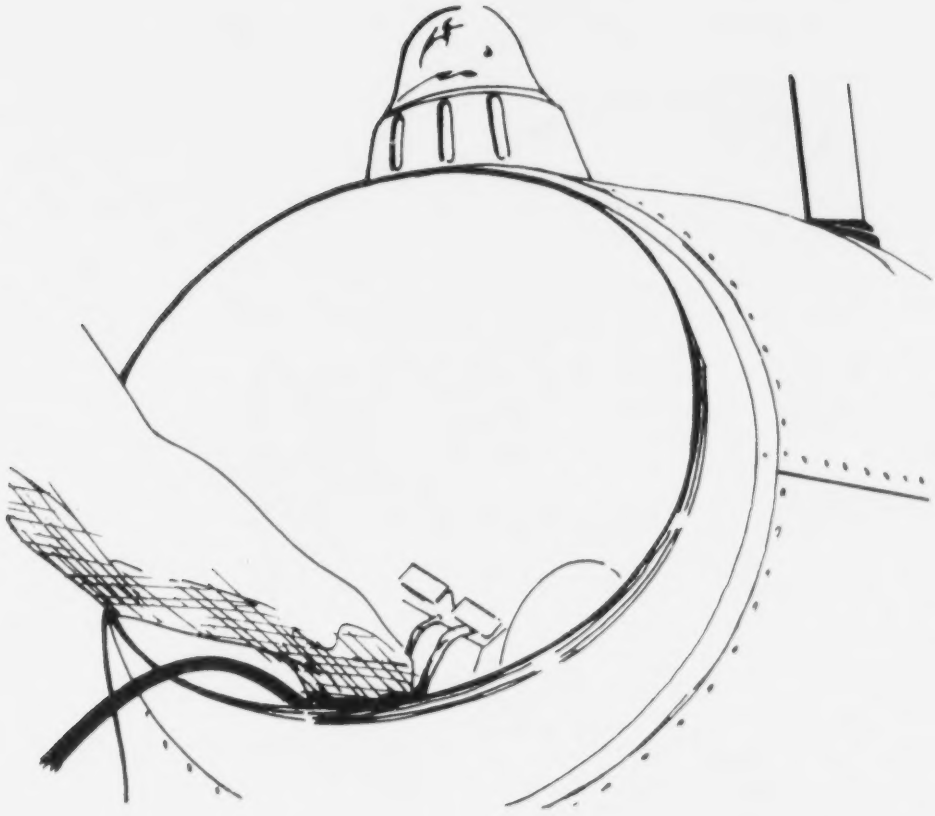


Figure 2-3. Installation of Heater Probes in Engine (Sheet 2 of 2)

c. Connect egt indicator check adapter to proper terminal posts on aircraft EGT indicator, observing correct polarity.

d. Place switch SW-1 in E.G.T. position

e. Place switch SW-6 in MECH. ZERO position and zero galvanometer by turning MECH. ZERO knob.

f. Set °C scale to indicate test temperature.

g. Turn switch SW-4 aircraft circuit resistance matching aircraft EGT indicator being tested (either 8° or 22° position).

h. Place switch SW-6 in RANGE position.

i. Turn potentiometer R-1 until galvanometer reads zero.

NOTE

The difference between temperature readings of °C scale and aircraft EGT indicator is error of aircraft EGT indicator and should not exceed applicable aircraft/engine technical manual tolerance.

j. Place switch SW-6 in MECH. ZERO position.

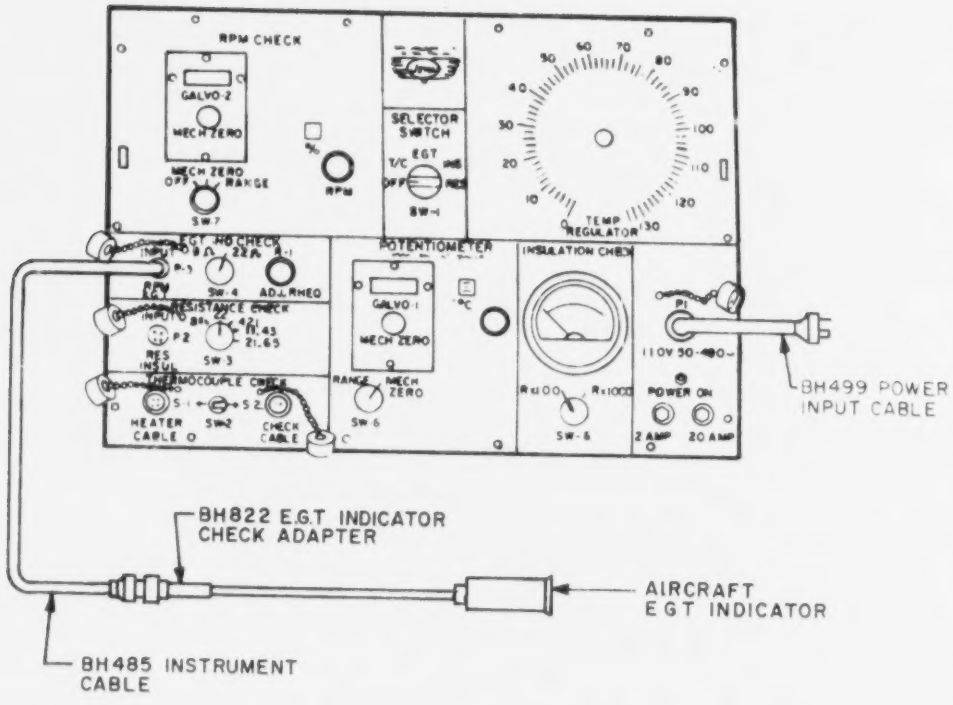


Figure 2–4. EGT indicator check.

k. Disconnect egt indicator check adapter from aircraft EGT indicator and instrument cable.

l. Disconnect instrument cable from connector P–3.

m. Properly stow instrument cable and egt indicator check adapter in cable storage compartment.

NOTE

Connect a copper wire jumper across terminal posts if EGT indicator is not reinstalled.

2–9. Resistance of Circuit Out of Tolorance (Figure 2–5).

CAUTION

A high resistance condition is dangerous because the aircraft EGT indicator will read low and the engine will be operating above indicated temperature.

NOTE

Since the resistors in the tester and the aircraft circuit are chromel-alumel, resistance test s are made with both the tester and the aircraft at the same ambient temperature.

a. Connect resistance check adapter to instrument cable and instrument cable to connector P–2.

b. Disconnect thermocouple leads from aircraft EGT indicator.

c. Connect resistance check adapter to proper thermocouple leads.

d. Place switch SW–6 in MECH. ZERO position and zero galvanometer by turning MECH. ZERO knob.

NOTE

Galvanometer must be zeroed before each resistance check.

e. Turn switch SW–3 to proper aircraft circuit resistance (either 8Ω, 22Ω, or 4.21Ω position.

f. Place switch SW–1 in RES. position.

g. Place switch SW–6 in RANGE position.

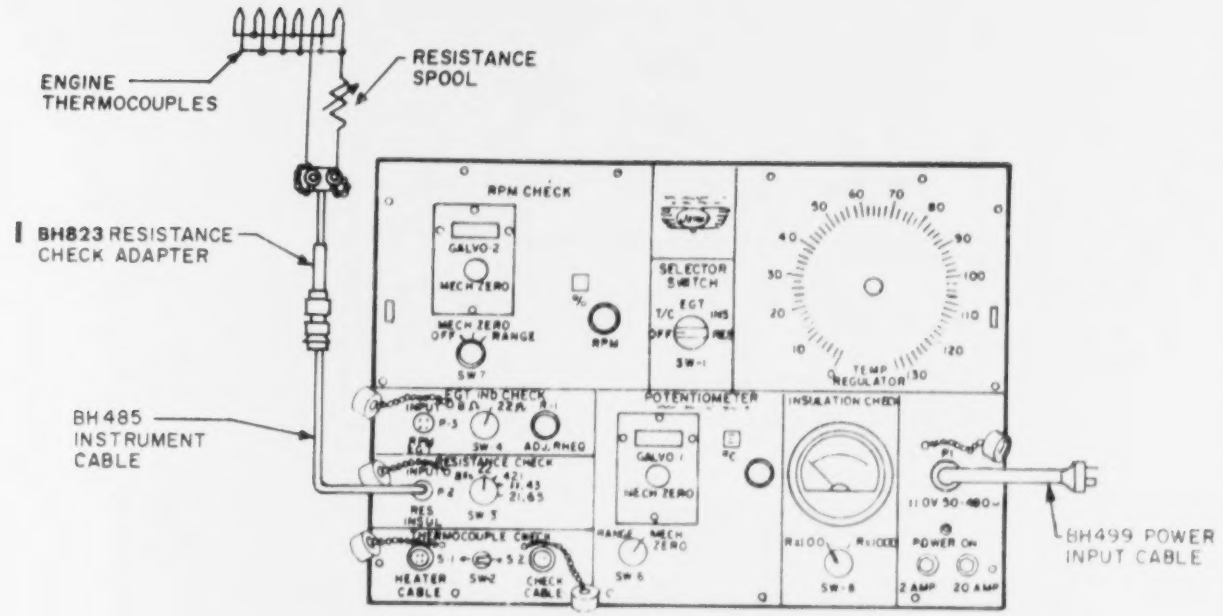


Figure 2-5. Resistance check.

NOTE

Clean and tighten all thermocouple harness connections before adjusting resistance spool.

h. Adjust resistance spool in aircraft until galvanometer reads zero plus or minus applicable tolerances (one division of galvanometer equals approximately 0.05 ohm). A deflection to the right indicates an increase in resistance.

i. Place switch SW-6 in MECH. ZERO position.

j. Disconnect resistance check adapter from thermocouple leads and from instrument cable.

k. Disconnect instrument cable from connector P-2.

l. Properly stow instrument cable and resistance check adapter in cable storage compartment.

2-10. Insulation Resistance Check (Shorts to Ground) (Figure 2-6).

a. Connect insulation check adapter to instrument cable and instrument cable to connector P-2.

b. Place switch SW-1 in INSUL. position.

c. Place switch SW-8 in Rx1000 position.

d. Short insulation check adapter leads together. INSULATION CHECK meter should read zero.

e. Place one lead of insulation check adapter on bare thermocouple lead in aircraft and one lead on aircraft ground. Insulation check meter should read the resistance specified for the aircraft being checked.

f. Place switch SW-1 in OFF position.

g. Disconnect insulation check adapter from instrument cable.

h. Disconnect instrument cable from connector P-2.

i. Properly stow instrument cable and insulation check adapter in cable storage compartment.

2-11. Shorts Between Leads (Using Insulation Resistance Check Circuit (Figure 2-6).

a. Remove thermocouple leads from EGT indicator.

b. Remove thermocouple leads from engine thermocouple harness at parallel points.

c. Connect insulation check adapter to instrument cable and instrument cable to connector P-2.

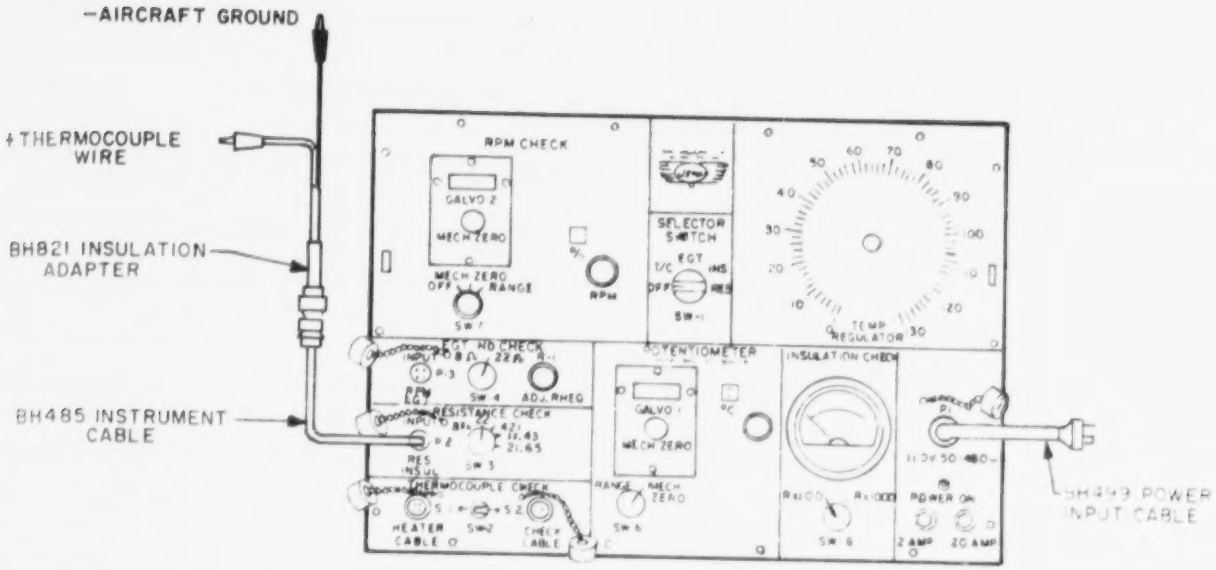


Figure 2–6. Insulation resistance check.

d. Place switch SW–1 in INSUL. position.

e. Place switch SW–8 in Rx1000 position.

f. Place insulation check adapter leads on both thermocouple leads at aircraft EGT indicator terminals or at parallel point. Insulation check meter should read the infinite (∞) resistance.

g. Place switch SW–1 in OFF position.

h. Disconnect insulation check adapter from instrument cable and aircraft EGT indicator terminals.

i. Disconnect instrument cable from connector P–2.

j. Properly stow instrument cable and insulation check adapter in cable storage compartment.

2–12. Continuity Check of Thermocouple and Harness (Figure 2–7).

NOTE

Indicator must be installed.

a. Connect continuity probe to heater cable.

b. Connect heater cable to HEATER CABLE connector on tester.

c. Place switch SW–1 in T/C position and switch SW–2 in S–1 position.

CAUTION

Never allow continuity check probe temperature to go above 800° Celsius (1472° Fahrenheit). Damage to probe could result.

d. Turn TEMP. REGULATOR knob to maximum and bring continuity check probe to a temperature within a range of 500° to 800° Celsius (932° to 1472° Fahrenheit) as read on °C scale.

e. Place switch SW–6 in MECH. ZERO position and zero galvanometer by turning MECH. ZERO knob.

f. Place switch SW–6 in RANGE position to take temperature readings. Adjust temperature selector knob until galvanometer reads zero. Temperature reading appears on the °C scale.

g. Check each engine thermocouple to eliminate any error due to one or more engine thermocouples being inoperative. When using continuity check probe, touch end of loop or twisted-type thermocouple; check sampling-type thermocouples by holding V-section of continuity check probe against case of sampling-type thermocouple end. In either case, aircraft EGT indi-

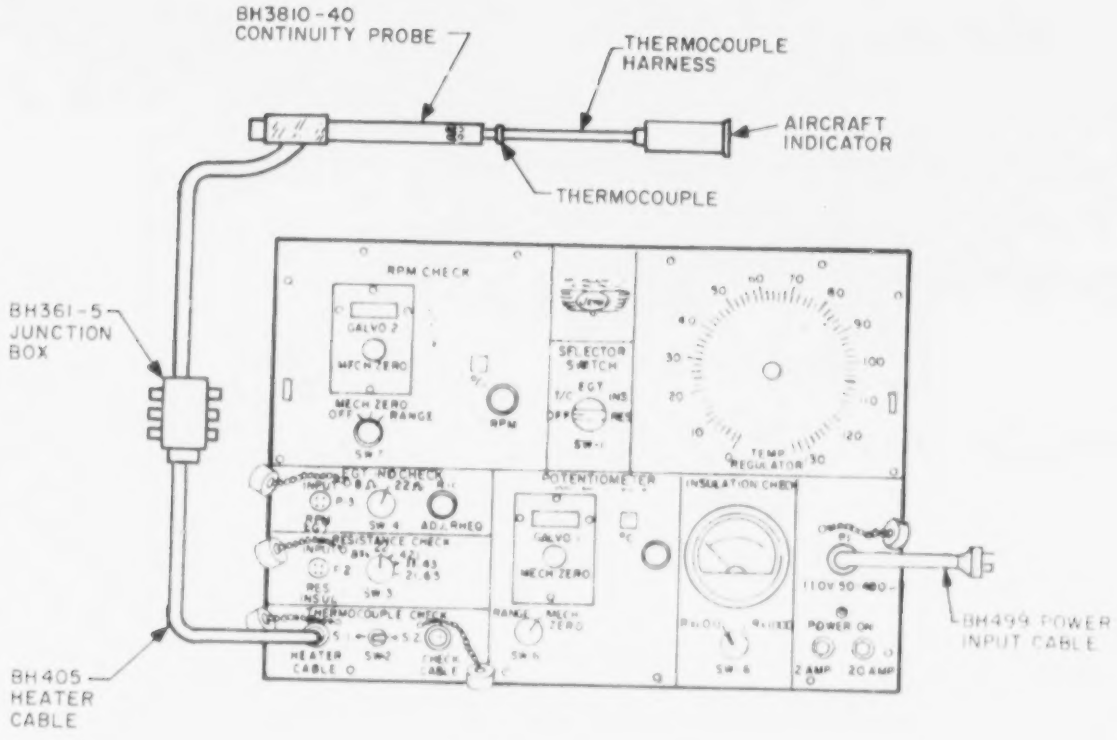


Figure 2-7. Continuity probe and sampling thermocouple.

cator must show a temperature rise as each engine thermocouple is checked.

h. Place switch SW- 6in MECH. ZERO position.

2-13. Transpositions (Crossing of Lead Wires).

An odd number of crossed lead wires (1, 3, etc) can be easily detected, since the aircraft EGT indicator will read backwards upon application of heat to the engine thermocouples. An even number of crossed lead wires (2, 4, etc), while much more difficult to detect, can be found by several methods:

a. The simplest method is with an ohmmeter. Chromel wire has approximately two and one-half times the resistance of alumel wire. To have a transposition, the chromel wire would have to be connected to the alumel wire. The resistance reading would be different than the 2-1/2 to 1 ratio.

b. Where possible, make a normal engine thermocouple test with tester connected to a hot engine (shortly after being run). When engine has cooled to ambient temperature, make another test. If there is a transposition, the difference in the readings will probably be large because of the thermals that were present in the first test.

c. Disconnect and check each terminal with a magnet. Chromel (+) is nonmagnetic; alumel (–) is magnetic.

d. Touch a hot soldering iron to each terminal. A termperature rise or fall on the aircraft EGT indicator indicates a transposition when the crossed terminal is touched.

2-14. Securing the Tester (Figure 2-2).

a. Place switch SW-1 in OFF position.

b. Place TEMP. REGULATOR knob in OFF position.

c. Remove heater probes from engine thermocouples and disconnect from outlets of junction box.

NOTE

If continuity check probe is connected, remove in accordance with *c* above.

d. Disconnect heater cable from junction box and connector.

e. Disconnect power inlet cable from power source and connector P-1.

f. Properly stow heater probes in probe storage compartment.

NOTE

Hot water probes may be stowed in the probe storage compartment without damage to the heater probes or tester.

b. Properly stow heater cable, power inlet cable, and junction box in cable storage compartment.

2-15. OPERATIONAL CHECK (Figure 2-8).

a. Disconnect engine thermocouple leads at aircraft EGT indicator.

b. Connect engine thermocouple leads to proper terminals of switch box and connect jumper leads of switch box to proper terminals of aircraft EGT indicator.

NOTE

With the switch box in the aircraft circuit and switch SW-5 on switch box in E.G.T. position, the aircraft EGT indicator is in the aircraft circuit. With switch SW-5 in JETCAL position, the indication of the engine thermocouple harness is carried back to the tester.

c. Connect check cable to switch box and to CHECK CABLE connector.

d. Connect rpm check adapter to instrument cable and instrument cable to connector P-3.

e. Disconnect aircraft tachometer cable from aircraft tachometer indicator.

f. Connect matching connectors of rpm check adapter to aircraft tachometer cable and aircraft tachometer indicator.

g. Place switch SW-5 on switch box in E.G.T. position. (Aircraft EGT indicator must be used on initial runup to be able to detect a hot start.)

h. Place switch SW-1 in T/C position.

i. Place switch SW-2 in S-2 position.

j. Set up galvanometer as follows:

(1) Place switch SW-6 in MECH. ZERO position and zero galvanometer with MECH. ZERO knob.

(2) Place switch SW-6 in RANGE position to take temperature readings. Adjust temperature selector knob until galvanometer reads zero. Temperature is shown on °C scale.

k. Place switch SW-7 in MECH. ZERO position and zero galvanometer with MECH. ZERO knob.

l. Place switch SW-7 in RANGE position.

m. Adjust R.P.M. knob until galvanometer reads zero. Read engine RPM on % scale.

n. Run up and stablize engine according to applicable technical manual for engine.

o. Monitor engine RPM during engine runup.

NOTE

The reading shown on % scale is correct RPM of engine. The difference between % scale reading and aircraft tachometer indicator reading is indicated error of aircraft tachometer system. A 1% RPM difference is allowed. If a difference exists refer to appropriate TM for testing of the indicator and tachometer generator."

p. Place switch SW-5 on switch box in JETCAL position.

q. Adjust temperature select knob until galvanometer reads zero.

r. Read temperature of engine thermocouples on °C scale. Difference between Jetcal and EGT indicator is indicator error and should not exceed system tolerance.

s. Disconnect rpm check adapter at aircraft tachometer cable and aircraft tachometer indicator. Connect aircraft tachometer cable at aircraft tachometer indicator.

t. Disconnect RPM check adapter from instrument cable.

u. Disconnect instrument cable from connector P-3.

v. Disconnect check cable from switch box and CHECK CABLE connector.

w. Disconnect engine thermocouple leads from switch box and jumper leads of switch box from aircraft EGT indicator. Conenct engine thermocouple leads at aircraft EGT indicator.

x. Properly stow check cable, instrument cable, switch box, and rpm check adapter in cable storage compartment.

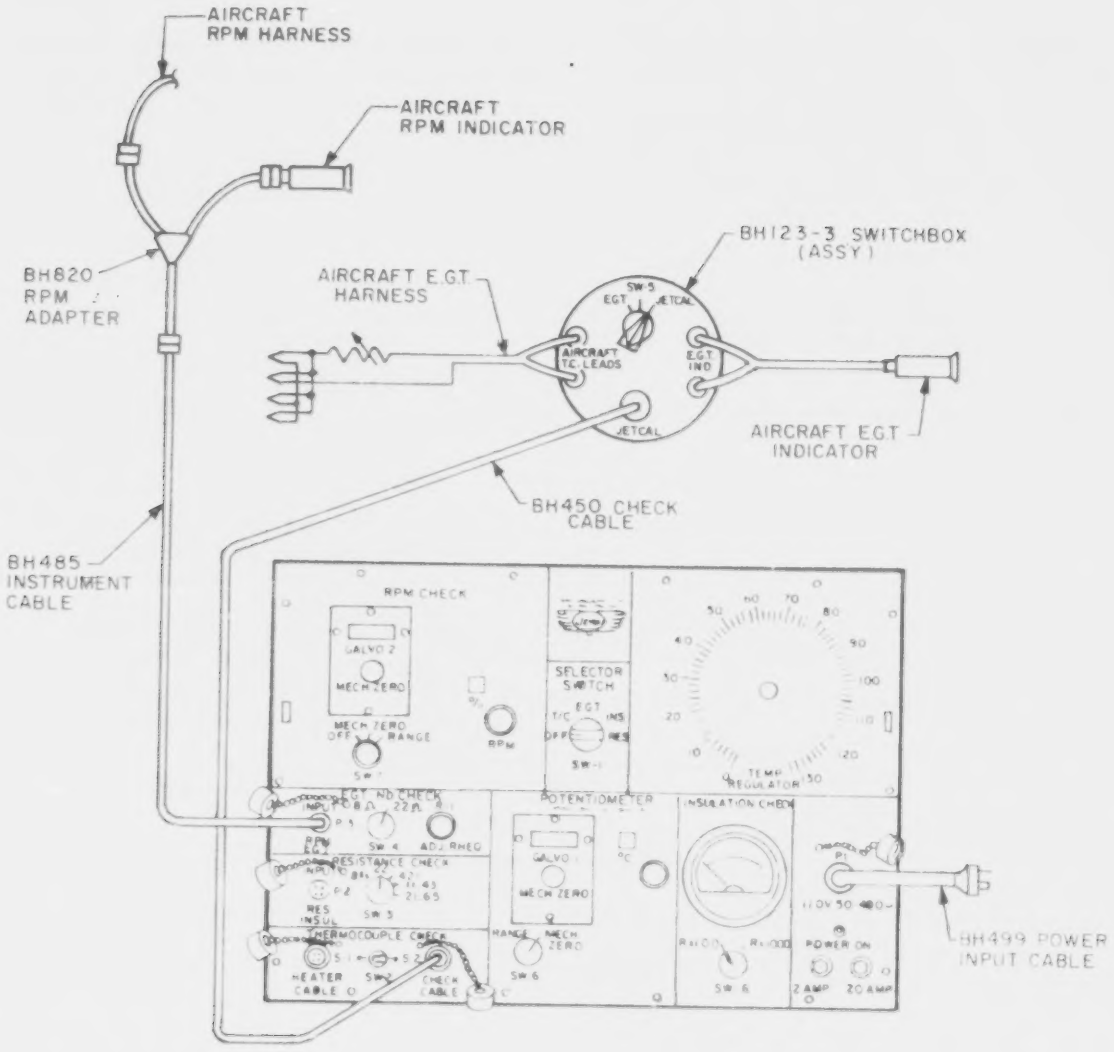


Figure 2-8. Operational check.

y. Secure tester after operation in accordance with paragraph 2-14.

2-16. One or More Engine Thermocouples Inoperative or Out of Calibration in Engine Paralleling Harness.

a. Engine Thermocouples Inoperative. This error is found in the regular testing of engine thermocouples with the continuity check probe (para. 2-12) and will be either a broken lead wire in the engine paralleling harness or a short to ground. If the trouble is a short to ground, the thermocouple current can leak off and never show on the aircraft EGT indicator. However, this grounded condition can be found by using the insulation resistance check described in paragraph 2-10.

b. Engine Thermocouples Out of Calibration. When the engine thermocouples are subjected to strong reducing or oxidizing atmospheres for a period of time, they will drift appreciably from their original calibration. On engine parrallel harnesses when individual engine thermocouples can be removed, the engine thermocouples may be bench checked individually using one heater probe connected to the tester in accordance with paragraph 2-17. On engines where individual thermocouples can not be removed, the entire thermocouple harness should be removed for bench check.

NOTE

A spacer of the same thickness as the wall of the exhaust duct and the thermocouple mounting boss is required to properly position the probe on the thermocouple.

Replace engine thermocouples not within specified manufacturer's tolerances.

2–17. Thermocouple Bench Check (Figure 2–9).

a. Remove thermocouple harness to be bench checked and place in suitable jig.

b. Prepare tester for operation per paragraphs 2–5*a* through *d*.

c. Connect the same number of heater probes to the junction box as thermocouples in harness to be tested. Place probes properly on thermocouples.

d. Connect check cable to tester at CHECK CABLE connector and to thermocouple harness. Use check cable adapter if necessary.

e. Place switch SW–1 in T/C position and switch SW–2 in S–1 position.

f. Place switch SW–6 in MECH. ZERO position and zero galvanometer by turning MECH. ZERO knob.

g. Place switch SW–6 in RANGE position and adjust TEMP. REGULATOR until heater probes reach test temperature.

h. With heater probes stabilized at test temperature, place SW–2 in S–2 position and read output of thermocouples.

i. The difference between the test temperature and the thermocouple output is the thermocouple error and should not exceed system tolerance.

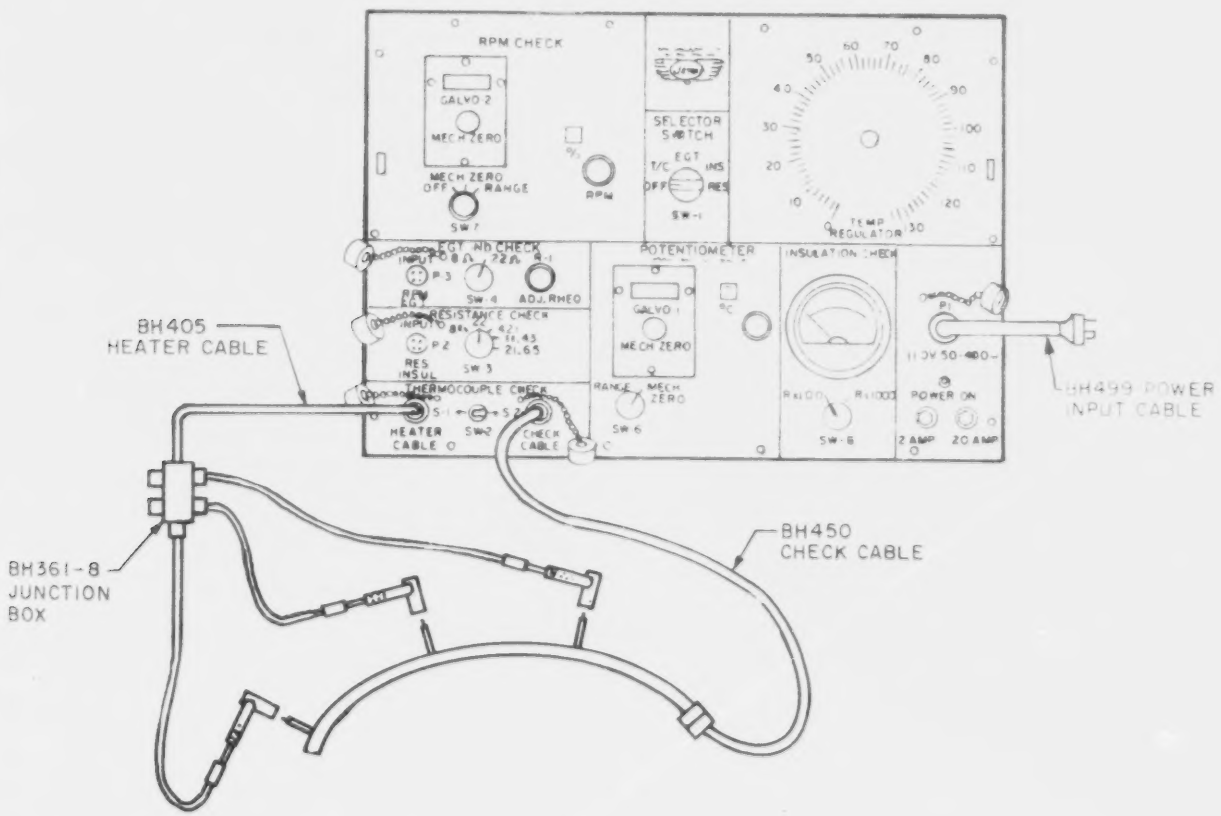


Figure 2–9. Thermocouple bench check.

2–18. Using Tester Potentiometer (°C Scale) for Auxiliary Temperature Measurements.

To use potentiometer (°C scale) to read the emf output of chromel-alumel thermocouple, prepare tester for operation in accordance with paragraph 2–5*a* through *c*. With switch SW–2 in the S–1 position, make chromel-alumel connection at pins D (+) and C (–), respectively. With switch SW–2 in the S–2 position, make chromel-alumel connection at pins B (+) and A (–), respectively. Secure tester after operation in accordance with paragraph 2–14.

Section III. OPERATION UNDER UNUSUAL CONDITIONS

2–19. General.

This section contains special instructions which are necessary to insure proper functioning of the tester under unusual conditions. The following special operating instructions are to be used in conjunction with operating instructions outlined in paragraphs 2–4 through 2–15.

2–20. Operation in Extreme Cold.

a. If possible, perform operation of tester in a properly heated, sheltered area.

b. When operating in an unsheltered area, provide best available temporary shelter to protect tester from freezing rain, sleet, or snow.

c. When not in use, keep tester under a protective cover if shelter is not available.

2–21. Operation in Extreme Heat.

a. If possible, perform operation of tester in a shaded and well-ventilated area.

b. When operating tester in an unsheltered area, provide best available temporary shelter to protect tester from direct rays of sun.

c. When not in use, keep tester in a shaded, protected area.

2–22. Operation in Dusty or Sandy Areas.

a. If possible, perform operation of tester in a sheltered, well-protected area.

b. Reduce inspection and servicing intervals and keep tester wiped clean as much as possible.

c. Provide best available shelter and operate only when wind is at a minimum.

d. When not in use, keep tester under a protective cover, in a sheltered, well-protected area.

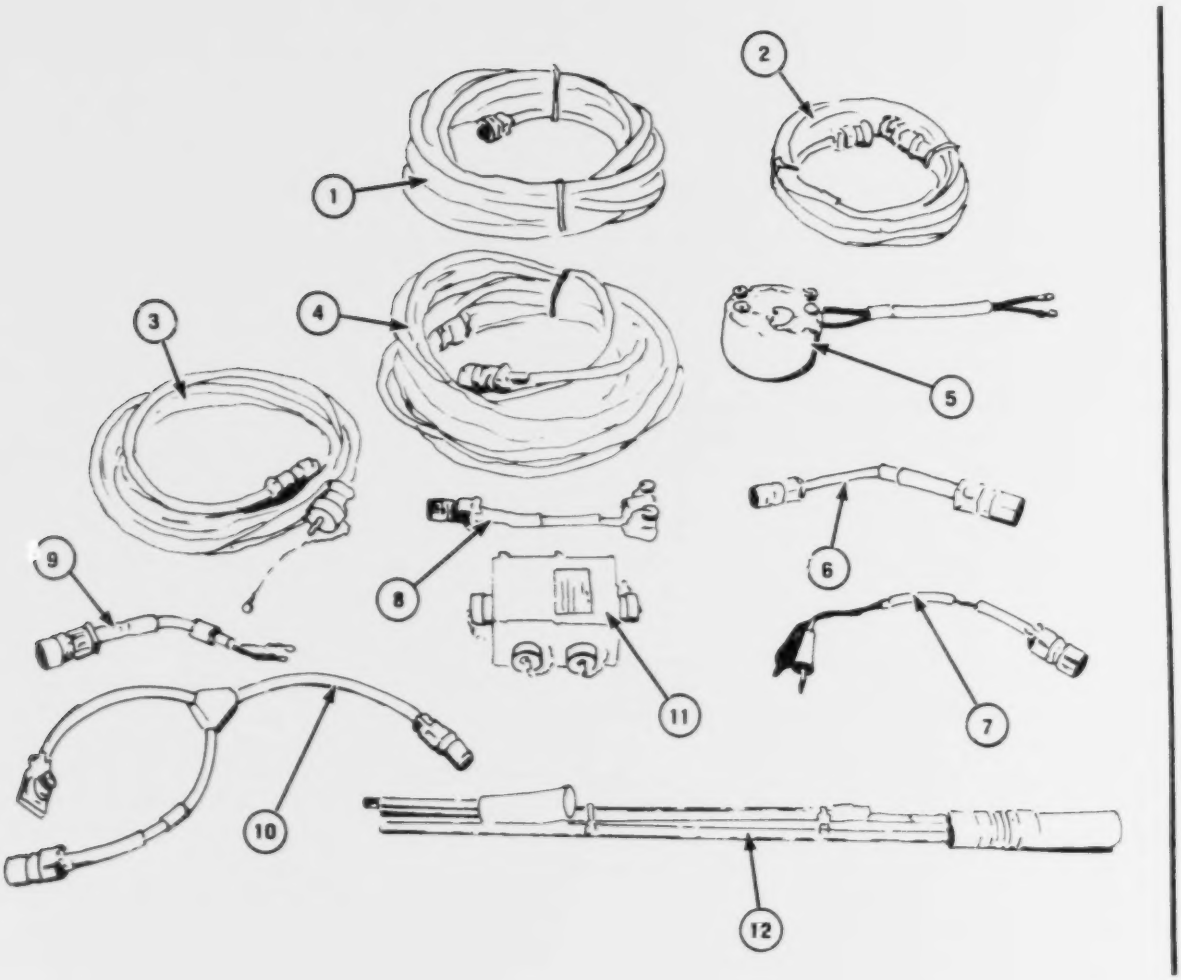
2–23. Operating in High Humidity Areas.

a. If possible, perform operation of tester in a sheltered, well-ventilated area.

b. Reduce inspection and servicing intervals and keep tester as dry as possible.

c. When operating in an unsheltered area, provide best available protective shelter and operate as weather conditions permit.

d. When not in use, keep tester under a protective cover, in a sheltered area.



Key to Figure 2-10.

1. Heater Cable
2. Check Cable
3. Power Inlet Cable
4. Instrument Cable
5. Switch Box
6. Check Cable Adapter
7. Insulation Check Adapter
8. Resistance Check Adapter
9. EGT Indicator Check Adapter
10. RPM Check Adapter
11. Junction Box
12. Extension Handle

Figure 2-10. Cable storage compartment.

CHAPTER 3

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. PREPARATION FOR INSTALLATION, STORAGE AND SHIPMENT

3-1. General.

This section provides a description of the inspections, servicing, and preparations necessary before the tester is placed in operation. When a new or reconditioned tester is received, maintenance personnel must determine if the tester is in condition to perform any mission within its intended capabilities. The failure to perform the initial inspections and servicing will affect the future operation of the tester. For this reason, it is necessaary to adhere closely to the following instructions.

The destruction of Army material shall be accomplished in accordance with the technical manual covering the destruction of Army material to prevent enemy use.

3-2. Unloading and Unpacking Equipment.

a. Unloading.

(1) Remove chock blocks and/or lines which secure tester to its carrier.

(2) Using a fork lift or suitable hoist, carefully lower tester onto a suitable cleared area.

b. Unpacking. (Figure 3-1)

(1) Remove tester from packing crate.

(2) Remove all barrier material and tape from tester.

(3) Unlatch and open door (16) of cable storage compartment. Remove any packing material from inside cable storage compartment and properly stow cables. Close and latch door.

(4) Unlatch and raise lid (5) of probe storage compartment (14). Remove any packing material from inside probe storage compartment and properly stow heater probes. Lower and latch lid.

(5) Unlatch and raise probe storage compartment. Remove any packing material from instrument compartment. Lower and latch probe storage compartment.

Section II. INSTALLATION

3-3. Installation of Separately Packed Components. (Figure 3-1)

If the handle assembly, support post, wheels, and wheel mounts have been removed for shipment, reassemble the tester as follows:

a. Handle Assembly. Install handle assembly as follows:

(1) Place pivot sockets (4) on handle (1).

(2) Position handle assembly on tester by springing handle (1) over bolts (3).

(3) Install wing nuts (2) on bolts (3).

b. Support Post. Install support post (23) as follows:

(1) Place support post (23) in position on bottom of base assembly (31).

(2) Attach support post (23) to base assembly (31) using screws (24) and locknuts (25).

c. Wheel Mounts. Install wheel mounts (28) as follows:

(1) Place wheel mounts (28) in position on bottom of base assembly (31).

(2) Attach wheel mounts (28) to base assembly (31) using screws (29) and locknuts (30).

d. Wheels. Install wheels (26) as follows:

(1) Place wheels (26) in position on wheel mounts (28).

(2) Secure wheels (26) on wheel mounts (28) using retaining rings (27).

Section III. INSPECTIONS AND SERVICING

3–4. Inspection After Uncrating.

a. Inspect exterior of tester for condition of paint, evidence of corrosion, cracks, and deep dents.

b. Inspect instrument compartment (fig. 2–1) for legibility of markings and security.

c. Inspect insulation check meter for cracked lens and security in instrument compartment.

d. Inspect for broken or otherwise damaged knobs, receptacles, and switches in instrument compartment.

e. Insure that instruction plate, nameplate, and wiring diagram plate are legible and properly secured.

f. Inspect heater probes (2, fig. 3–2) for dents, deterioration, and proper stowage in probe storage compartment (3).

g. Visually inspect wheels for breaks, deep cuts, and other defects.

h. Ascertain that all cables, switch box, junction box, and adapters have been shipped with tester and are stowed in cable storage compartment.

3–5. Service After Uncrating.

a. Clean tester, components, and accessories with dry cleaning solvent (item 1, table 1–1).

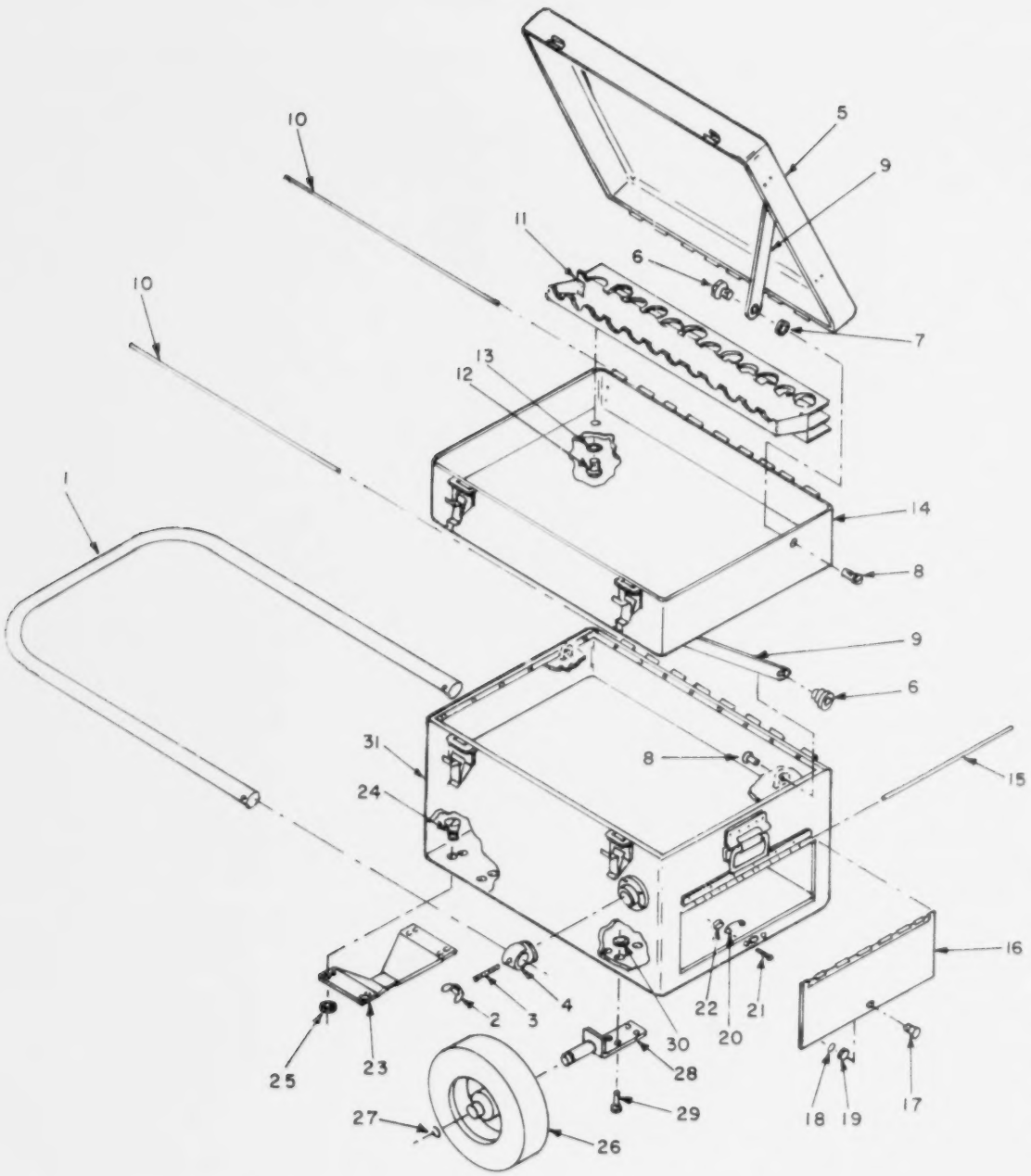
b. Lubricate tester as outlined in paragraph 3–11.

3–6. Daily Inspection.

The operational preventive maintenance services are performed before operation, during operation, and after operation. These preventive maintenance services are listed in Table 3–1, Inspection Requirements.

CAUTION

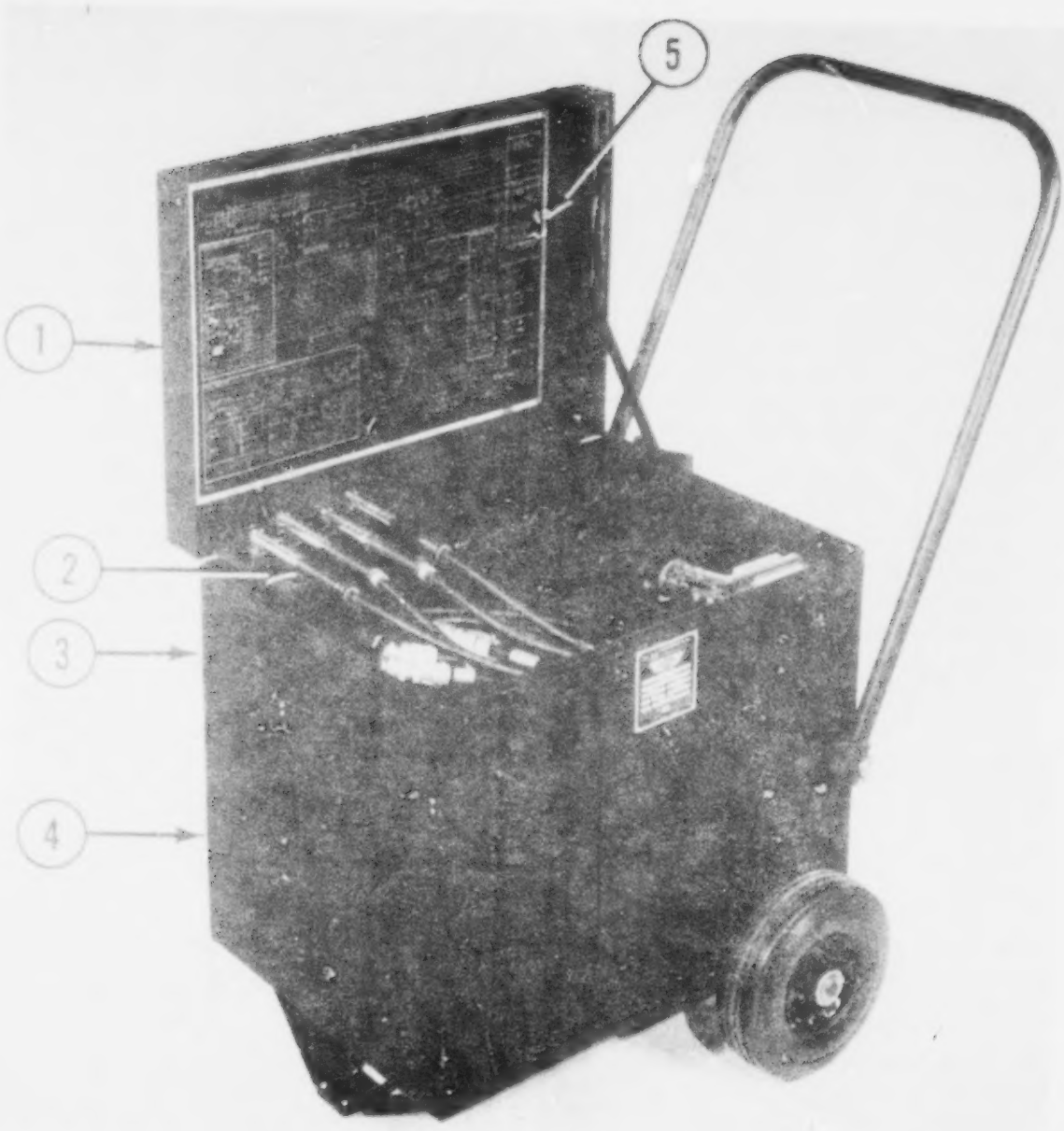
Stop operation immediately if a defect is noted that could cause damage to the tester by continuing the operation.



Key to Figure 3–1

1. Handle
2. Wing Nut
3. Bolt
4. Pivot Socket
5. Lid
6. Stop Arm Support
7. Spacer
8. Screw
9. Stop Arm
10. Hinge Pin
11. Rack
12. Screw
13. Washer
14. Probe Storage Compartment
15. Hinge Pin
16. Door
17. Fastener
18. Snap Ring
19. Grommet
20. Spring
21. Screw
22. Lock Nut
23. Support Post
24. Screw
25. Lock Nut
26. Wheel
27. Retaining Ring
28. Wheel Mount
29. Screw
30. Lock Nut
31. Base Assembly

Figure 3–1. Box assembly.



Key to Figure 3–2

1. Lid
2. Heater Probes
3. Probe Storage Compartment
4. Base Assembly
5. Wiring Diagram Plate

Figure 3–2. Probe storage compartment.

Section IV. PREVENTIVE MAINTENANCE

3–7. Organizational Preventive Maintenance Services.

Preventive maintenance procedures are performed periodically by organizational maintenance personnel. The weekly interval will be equivalent to a maximum of 10 operations. The monthly interval will be equivalent to a maximum of 25 operations. These maintenance services and inspections are listed in the organizational preventive maintenance chart.

Table 3–1. Inspection Requirements

Procedures	Reference Applicable to Each Item
BEFORE OPERATION	
Inspect tires for breaks and deep cuts..	para. 3–4*g*
Inspect instruction plate and deck assembly for legibility of markings.	para. 3–4*b* and 3–4*e*
Inspect tester for condition of paint, evidence of corrosion, and dents.	para. 3–4*a*
Inspect check adapters, cable assemblies, and heater probes for breaks, cuts, cracks, or other damage.	para. 3–4*g* and 3–4*h*
Inspect insulation check meter for broken lens and security in deck assembly.	para. 3–4*c*
Inspect knobs and switches for proper operation and security in deck assembly.	para. 3–4*d*
Inspect connectors for cracks, bent or broken pins, and missing dust covers.	para. 3–4*d*
DURING OPERATION	
Procedures	Reference Applicable to Each Item
Insure that check adapters, cable assemblies, and heater probes are properly installed and secured.	para. 2–5 through 2–18
Insure that instruments are operating normally and with minimum fluctuations.	para. 2–5 through 2–18
Be alert for unusual conditions indicating tester malfunction.	
AFTER OPERATION	
Inspect check adapters, cable assemblies, and heater probes for breaks, cracks, and other damage.	para. 3–4*f* and 3–4*h*
Insure that check adapters, cable assemblies, and heater probes are clean and properly stowed.	
Inspect insulation check meter for broken lens and security in deck assembly.	para. 3–4*c*
Inspect knobs and switches for proper operation and security in deck assembly.	para. 3–4*d*
Inspection connectors for cracks, bent or broken pins, and dust covers installed.	para. 3–4*d*
Record all deficiencies and corrective action taken on DA Form 2404.	

Table 3–1. Inspection Requirements—Continued

AFTER OPERATION—Continued

Procedures	Reference Applicable to Each Item
Protect against damage and tampering by parking tester in a protected area.	

3–8. General.

To insure that the tester is in operational readiness at all times, it must be systematically inspected so that defects may be discovered and corrected before resulting in serious damage to, or failure of, equipment. Systematic preventive maintenance services are based on scheduled inspections and services to be accomplished by operators and organizational maintenance personnel. The preventive maintenance inspections will be recorded in accordance with procedures outlined in the inspection worksheets listed in paragraph 1–2. Each form covers a specific inspection period, providing a system of progressive preventive maintenance. These forms are available through normal supply channels.

3–9. Cleaning.

Clean the tester, components, and accessories with dry cleaning solvent (item 1, table 1–1).

3–10. General Lubrication Information.

Paragraph 3–11 contains lubrication information useful for the proper care of the tester. Due to the construction of the tester electrical system and component parts, only minor lubrication is required. The hinges and wheels of the tester are to be lubricated as necessary for ease of operation and movement and to prevent corrosion.

3–11. Detailed Lubrication Information.

a. Hinges. Using an oil can, apply a few drops of oil (item 9, table 1–2) to hinges. Wipe excess oil from hinges with a suitable cloth.

b. Wheels. With wheels removed, apply a light coating of grease (item 10, table 1–1) to wheel mount axles.

3–12. Extreme Environmental Maintenance.

a. Cold. Provide best possible shelter to protect tester from freezing rain, sleet, or snow.

b. Heat. Provide best possible shelter to protect tester from direct rays of sun.

c. Dust and Sand. If possible, perform al. maintenance in a sheltered, well protected area.

(1) Reduce inspection and servicing intervals and keep tester wiped clean.

(2) Keep tester under a protective cover.

d. Humidity. If possible, perform all maintenance in a well ventilated or dry area.

Section V. OPERATIONAL CHECKOUT OF TESTER AND ACCESSORIES

3–13. Heater Probe Circuit Operation Check. (Figure 3–3)

After 10 test operations, the heater probes, heater cable, junction box, and galvanometer (GALVO–1) shall be operationally checked as follows.

NOTE

All heater probes shall be checked after every 10 test operations since a defective heater or thermocouple in a heater probe can indicate errors greater than 10° Celsius (50° Fahrenheit) when checking an engine thermocouple harness.

a. Place switch SW–1 in OFF position.

b. Place TEMP. REGULATOR knob in 0 position.

WARNING

Ground tester with pigtail ground wire in power inlet cable before using tester.

c. Connect power inlet cable to connector P–1 and to a 110-volt, 50 to 400 Hertz, ac power source.

d. Connect heater cable to junction box and to tester at HEATER CABLE connector.

e. Attach one heater probe to junction box.

f. Turn TEMP. REGULATOR knob to maximum and observe galvanometer for deflection which indicates heater probe is operating and

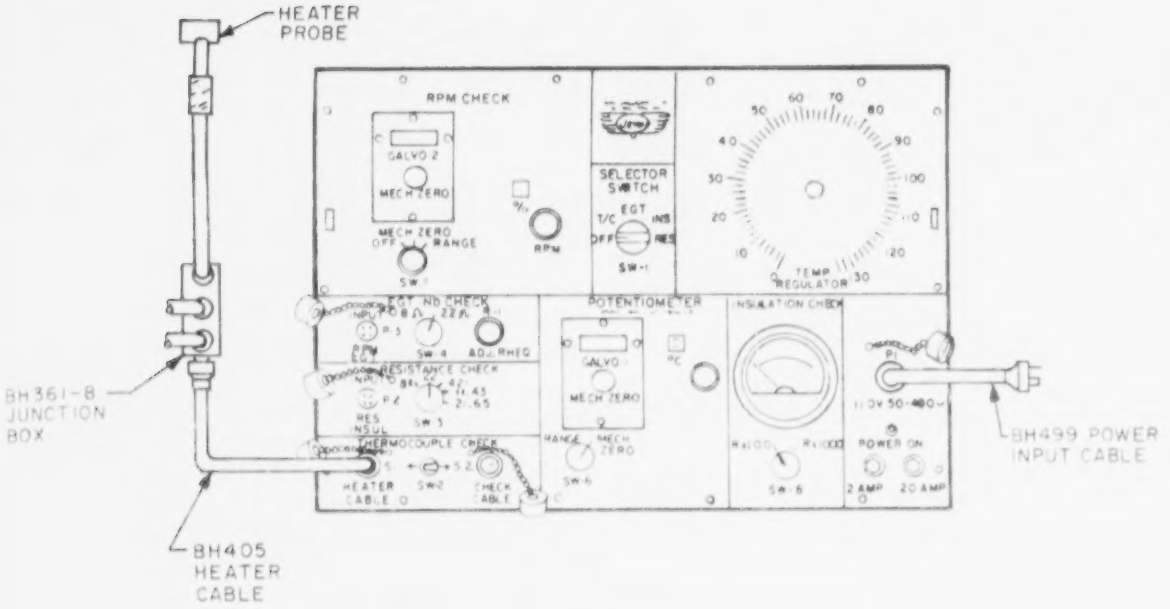


Figure 3–3. Heater probe circuit operation check.

that there is continuity from junction box, through heater cable, and galvanomeer.

g. Place TEMP. REGULATOR knob in 0 position and switch SW–1 in OFF position. Disconnect heater probe at junction box.

h. Repeat *f* and *g* above and test remaining heater probes and junction box outlets.

i. Replace any heater probe that does not indicate a temperature rise on galvanometer. Replace junction box if any outlet does not indicate continuity.

j. Place SW–6 in MECH. ZERO position.

3–14. Check Cable Circuit Continuity Check. (Figure 3–4)

After 10 test operations, the check cable circuit shall be operationally checked as follows.

a. Connect check cable to CHECK CABLE connector.

b. Insert a replacement thermocouple of known quality in terminals A–, B+) of check cable.

c. Place switch SW–1 in T/C position.

d. Place switch SW–2 in S–2 position.

e. Place switch SW–6 in MECH. ZERO position and zero galvanometer with mechanical zero knob.

f. Place switch SW–6 in RANGE position.

g. Note galvanometer for deflection which indicates continuity through check cable to galvanometer.

NOTE

If no deflection is noted, make sure indication on °C scale is not equal to ambient temperature.

h. Replace check cable if galvanometer does not indicate continuity.

i. Place switch SW–6 in MECH. ZERO position.

j. Place switch SW–2 in SW–1 position and remove replacement thermocouple from check cable.

k. Remove check cable from CHECK CABLE connector.

l. Properly stow check cable in cable storage compartment.

m. Secure tester after operation.

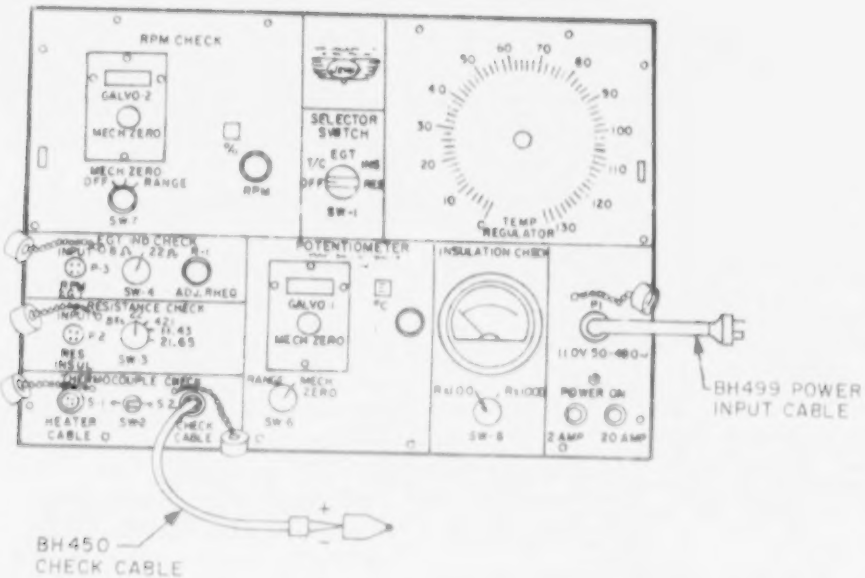


Figure 3-4. Check cable circuit continuity check.

3-15. Potentiometer Continuity Check. (Figure 3-4)

After 10 test operations, the POTENTIOMETER circuit shall be operationally checked as follows:

CAUTION

Never use an ohmmeter or voltmeter to check the potentiometer circuit for continuity as damage to galvanometer will result.

a. Insert a replacement thermocouple of known quality in A (-) and B (+) sockets of CHECK CABLE connector.

b. Place switch SW-1 in T/C position.

c. Place switch SW-2 in S-2 position.

d. Place switch SW-6 in MECH. ZERO position and zero galvanometer with mechanical zero knob.

e. Place switch SW-6 in RANGE position.

f. Apply heat to the replacement thermocouple.

g. With replacement thermocouple heating, note galvanometer for deflection which indicates continuity of the potentiometer circuit.

h. If potentiometer circuit does not indicate continuity, refer to Table 3-2 to locate defects.

i. Place switch SW-6 in MECH. ZERO position.

j. Place switch SW-2 in S-1 position and remove replacement thermocouple from CHECK CABLE connector.

k. Secure tester after operation.

3-16. EGT Indicator Circuit Operation Check. (Figure 3-5)

After 25 test operations, the EGT indicator circuit shall be functionally checked as follows:

a. Prepare tester for operation in accordance with paragraph 3-13*a* through *c*.

b. Connect instrument cable to egt indicator check adapter and instrument cable to connector P-3.

c. Place switch SW-1 in EGT position.

d. Place switch SW-6 in MECH. ZERO position and zero galvanometer with mechanical zero knob.

e. Place switch SW-6 in RANGE position.

f. Connect terminals of egt indicator check adapter together.

g. Place switch SW-4 in 8Ω position.

h. Turn potentiometer R-1 and note galvanometer which indicates egt indicator circuit continuity.

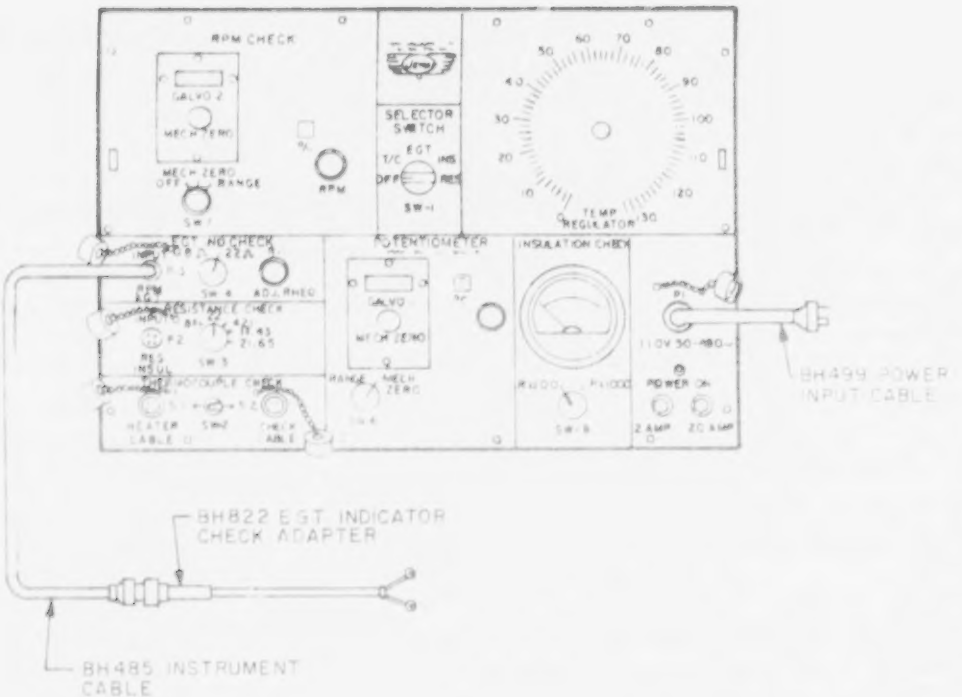


Figure 3-5. EGT indicator circuit operation check.

i. If galvanometer does not deflect with switch SW-4 in 8Ω position, place switch SW-4 in 22Ω position.

j. Repeat *h* above.

k. If galvanometer does not deflect in either position of switch SW-4, refer to Table 3-2 to locate defects in egt indicator circuit.

l. Place switch SW-6 in MECH. ZERO position.

m. Disconnect egt indicator check adapter from instrument cable.

n. Disconnect instrument cable from connector P-3.

o. Properly stow instrument cable and egt indicator check adapter in cable storage compartment.

p. Secure tester after operation in accordance with paragraph 2-14.

3-17. Troubleshooting.

Table 3-2 provides information useful in diagnosing and correcting unsatisfactory operation of the tester. Each trouble symptom stated is followed by a list of probable causes. The possible remedy recommended is described opposite the probable cause. The use of conventional troubleshooting and corrective methods will enable organizational maintenance personnel to maintain the tester in operational readiness. In table 3-2, assume that the tester is properly connected to a 110-volt, 50 to 400 Hertz, ac power source and that cable connections, switch positions, etc, have been accomplished in accordance with paragraphs 2-5 through 2-18.

NOTE

Always recheck test setup thoroughly before assuming the tester is at fault.

Table 3-2. Troubleshooting

Malfunction	Probable cause	Corrective action
1. Entire tester circuit inoperative with power source connected switch SW-1 in any position except OFF).	*a.* No input voltage.	*a.* Check power source and inlet cable.
	b. Both fuses blown.	*b.* Replace fuses (4-35).
	c. Defective power inlet cable.	*c.* Replace power inlet cable.

Table 3–2. Troubleshooting—Continued

Malfunction	Probable cause	Corrective action
2. Power source connected to tester, but power on light does not indicate.	*a.* Lamp burned out. *b.* Defective power inlet cable.	*a.* Replace lamp (para. 4–34). *b.* Replace power inlet cable.
3. Switch SW–1 in T/C position; no light beam in galvanometer (GALVO–1).	*a.* Lamp burned out. *b.* Defective power inlet cable.	*a.* Replace lamp (para. 4–33). *b.* Replace power inlet cable.
4. Heater probes will not heat with switch SW–1 in T/C position.	*a.* Blown fuse (20 amp). *b.* Defective heater cable. *c.* No input voltage.	*a.* Replace fuse (para. 4–35). *b.* Replace heater cable. *c.* Check power source and inlet cable.
5. Switch SW–1 in E.G.T. position; no light beam in galvanometer (GALVO–1).	*a.* Lamp burned out. *b.* Defective power inlet cable.	*a.* Replace lamp (para. 4–33). *b.* Replace power inlet cable.
6. Heater probes will not heat with switch SW–1 in E.G.T. position.	*a.* Blown fuse (20 amp). *b.* Defective heater cable. *c.* No input voltage.	*a.* Replace fuse (para. 4–35). *b.* Replace heater cable. *c.* Check power source and power inlet cable.
7. Galvanometer (GALVO–1) will not zero with switch SW–1 in RES. position.	*a.* Improper connections to circuit being tested. *b.* Defective instrument cable or check adapter.	*a.* Make proper connections (para. 2–5 through 2–18). *b.* Replace defective instrument cable or check adapter.
8. INSULATION CHECK meter will not zero with input shorted and switch SW–1 in INSUL. position.	a. Defective instrument cable or check adapter.	*a.* Replace defective instrument cable or check adapter.
9. Switch SW–7 in RANGE position; no light beam in galvanometer (GALVO–2).	*a.* Lamp burned out. *b.* Blown fuse (2 amp).	*a.* Replace lamp (para. 4–33). *b.* Replace fuse (para. 4–35).
10. Galvanometer (GALVO–2) will not zero with switch SW–7 in RANGE position; relay (RLY–1) inoperative.	*a.* Defective tube V1.	*a.* Replace tube V1 (para 4–36).
11. Galvanometer (GALVO–2) will not zero with switch SW–7 in RANGE position; relay (RLY–1) operating.	*a.* Defective tube V1, V2, or V3.	*a.* Replace tube V1, V2, or V3 (para. 4–36).
12. R. P. M. CHECK CIRCUIT operative, all other circuits inoperative.	*a.* BH1766 fuse blown out.	*a.* Replace fuse (13, fig. 4–7).

CHAPTER 4

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

Section I. PREPARATION FOR MAINTENANCE, STORAGE, AND RESHIPMENT

4-1. General.

This section provides a description of the inspections, servicing, and preparations necessary before the tester is placed in operation. When a new or reconditioned tester is received, maintenance personnel must determine if the tester is in condition to perform any mission within its intended capabilties. The failure to perform the initial inspections and servicing will affect the future operation of the tester. For this reason, it is necessary to adhere closely to the following instructions.

4-2. Unloading and Unpacking Equipment.

a. Unloading.

(1) Remove chock blocks and/or lines which secure tester to its carrier.

(2) Using a fork lift or suitable hoist, carefully lower tester onto a suitable cleared area.

b. Unpacking. (Figure 3-1)

(1) Remove tester from packing crate.

(2) Remove all barrier material and tape from tester.

(3) Unlatch and open door (16) of cable storage compartment. Remove any packing material from inside cable storage compartment and properly stow cables. Close and latch door.

(4) Unlatch and raise lid (5) of probe storage compartment (14). Remove any packing material from inside probe storage compartment and properly stow heater probes. Lower and latch lid.

(5) Unlatch and raise probe storage compartment. Remove any packing material from instrument compartment. Lower and latch probe storage compartment.

4-3. Inspection and Servicing.

a. Inspection.

(1) Inspect exterior of tester for condition of paint, evidence of corrosion, cracks, and deep dents.

(2) Inspect instrument compartment (fig. 2-1) for legibility of markings and security.

(3) Inspect insulation check meter for cracked lens and security in instrument compartment.

(4) Inspect for broken or otherwise damaged knobs, receptacles, and switches in instrument compartment.

(5) Insure that instruction plate, nameplate, and wiring diagram plate are legible and properly secured.

(6) Inspect heater probes (2, fig. 3-2) for dents, deterioration, and proper stowage in probe storage compartment (3).

(7) Visually inspect wheels for breaks, deep cuts, and other defects.

(8) Ascertain that all cables, switch box, junction box, and adapters have been shipped with tester and are stowed in cable storage compartment (16, fig. 3-1).

b. Servicing.

(1) Clean tester, components, and accessories with dry cleaning solvent (item 1, table 1-1).

(2) Lubricate tester as outlined in paragraph 3-10.

4-4. Installation of Separately Packed Components. (Figure 3-1)

If the handle assembly, support post, wheels, and wheel mounts have been removed for shipment, reassemble the tester as follows:

a. Handle Assembly. Install handle assembly as follows:

(1) Place pivot sockets (4) on handle (1).

(2) Position handle assembly on tester by springing handle (1) over bolts (3).

(3) Install wing nuts (2) on bolts (3).

b. Support Post. Install support post (23) as follows:

(1) Place support post (23) in position on bottom of base assembly (31).

(2) Attach support post (23) to base assembly (31) using screws (24) and locknuts (25).

c. Wheel Mounts. Install wheel mounts (28) as follows:

(1) Place wheel mounts (28) in position on bottom of base assembly (31).

(2) Attach wheel mounts (28) to base assembly (31) using screws (29) and locknuts (30).

d. Wheels. Install wheels (26) as follows:

(1) Place wheels (26) in position on wheel mounts (28).

(2) Secure wheels (26) on wheel mounts (28) using retaining rings (27).

4-5. Preparation for Storage.

Paragraphs 4-6 and 4-7 provide instructions for the limited storage of equipment and inspection of equipment in storage.

4-6. Limited Storage

a. Inspection.

(1) Perform operational preventive maintenance services (para. 3-6).

(2) Perform organizational preventive maintenance services (para. 3-7).

(3) Make sure all cables and accessories are present and in good condition.

b. Preservation.

(1) Correct any deficiencies noted in *a*(1) and (2) above.

(2) Touch up painted surfaces in accordance with TM 9-213.

(3) Properly stow all accessories in probe and cable storage compartments.

(4) Place four fresh bags of desiccant (item 11, table 1-1) and one humidity indicator (item 12, table 1-1) in each of the following areas:

(a) Probe storage compartment.
(b) Deck assembly compartment.
(c) Cable storage compartment.

(5) Secure all latches and fasteners securely and provide an airtight seal for each compartment using pressure sensitive tape (item 13, table 1-1). Pay particular attention to hinges and all attaching hardware.

(6) Store tester in a dry warehouse or other area protected against weather and extremes of temperature and humidity. Position handle of tester over front of tester to conserve space and place tester on blocks.

NOTE

If suitable storage facilities are not available, prepare tester as for shipment (para. 4-8) and store under suitable cover.

4-7. In Storage Inspection and Maintenance.

a. Inspect tester externally for signs of corrosion, damage, and pilferage.

b. Open tester monthly and inspect humidity indicators. Replace desiccant bags if indicated and reseal compartments (para. 4-6).

4-8. Preparation for Reshipment.

The exact methods by which the tester is prepared may vary, but the instructions outlined in this section may be applied to any general preparation of equipment for domestic shipment. The following method requires no disassembly of the tester.

Prepare the tester for reshipment in accordance with the following instructions:

a. Remove all foreign matter from tester and its accessories using dry cleaning solvent (item 1, table 1-1). Do not allow dry cleaning solvent to come in contact with electrical wiring.

b. A shipping pallet (figure 4-1) can be prepared and used for more stability within the shipping container.

c. When step *b* above is used, strap the tester to the pallet with strapping material. Four holes are provided in pallet.

d. Preserve, wrap, and crate tester as described in method IIb of Military Specification MIL-P-116.

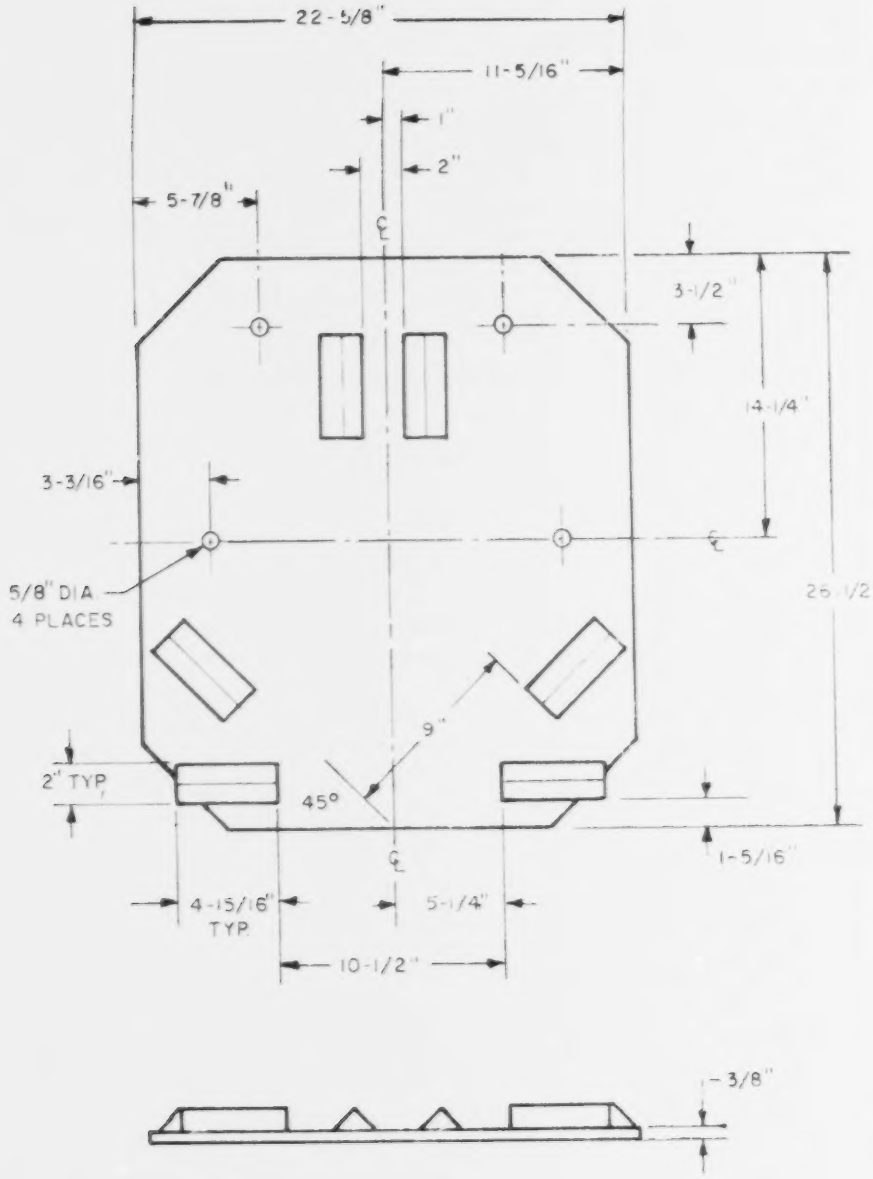


Figure 4-1. Shipping pallet.

Section II. CHECKOUT AND ANALYSIS

4-9. General.

This section contains information for testing various functions of the tester. This information, together with troubleshooting information contained in table 4-1, will enable maintenance personnel to rapidly localize tester malfunctions. Testers will be referred to direct support unit by using units for performance of the following tests after 25 operations, or monthly, whichever occurs first, or at the request of responsible organizational maintenance personnel if improper operation is suspected.

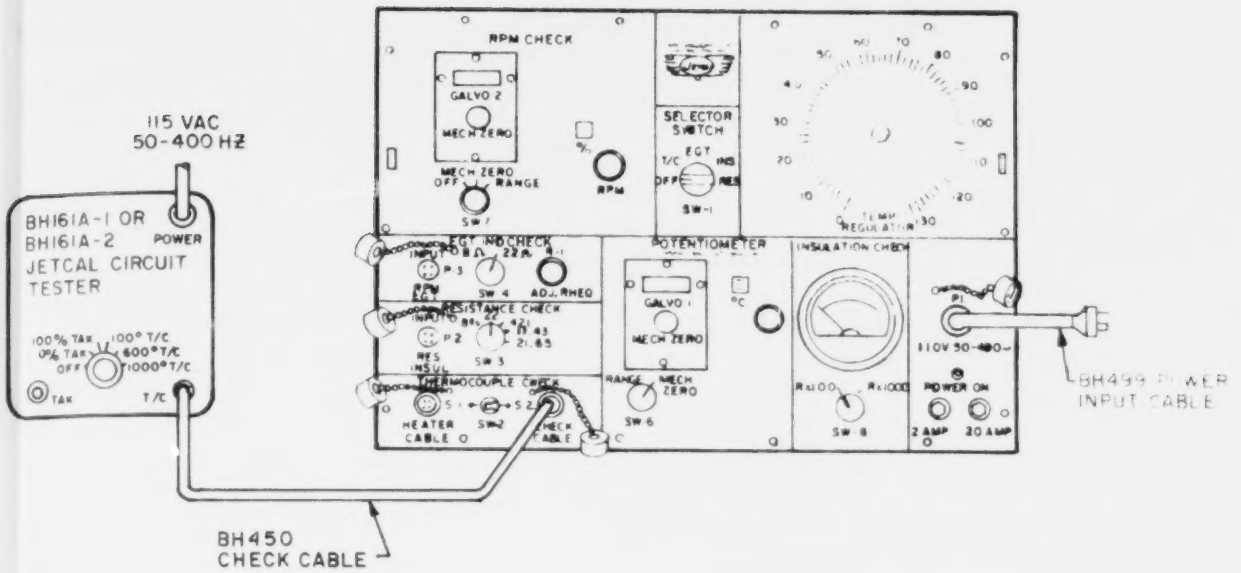


Figure 4–2. Connections for potentiometer circuit checkout using circuit tester, part No. BH161A–2.

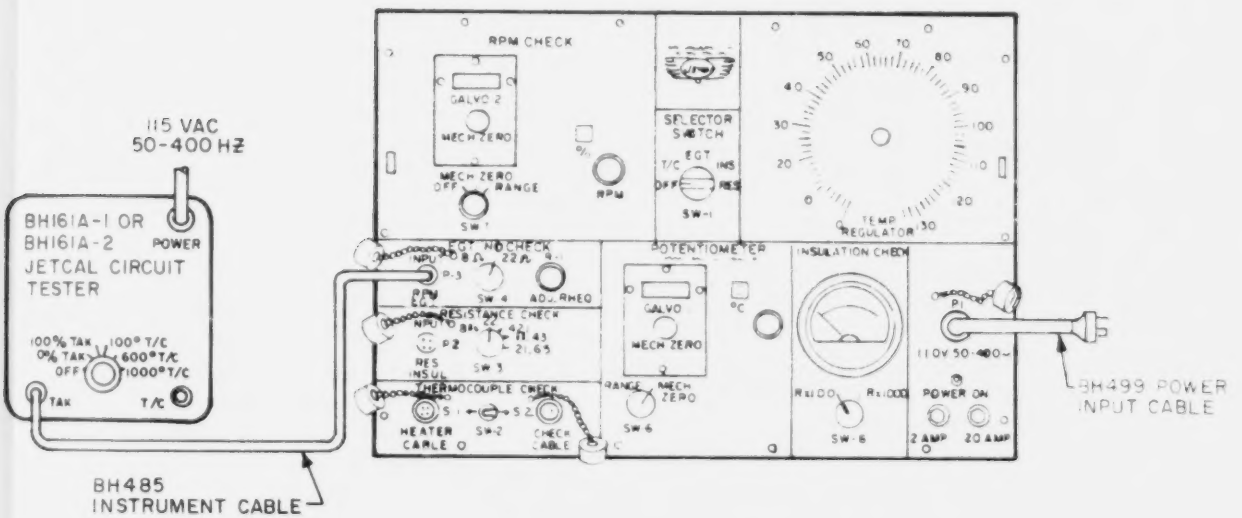


Figure 4–3. Connections for RPM check circuit checkout using circuit tester, part no. BH161A–2.

d. Attach leads of insulation check adapter to a 1000 ohm resistor. Insulation check meter should read 10 (1000 ohms) ± 10 percent.

NOTE

Use ± 10 percent tolerance precision resistors in *d* above and *g* below. Resistors of closer tolerance may be used if available. Accuracy of test depends on actual value of resistor used.

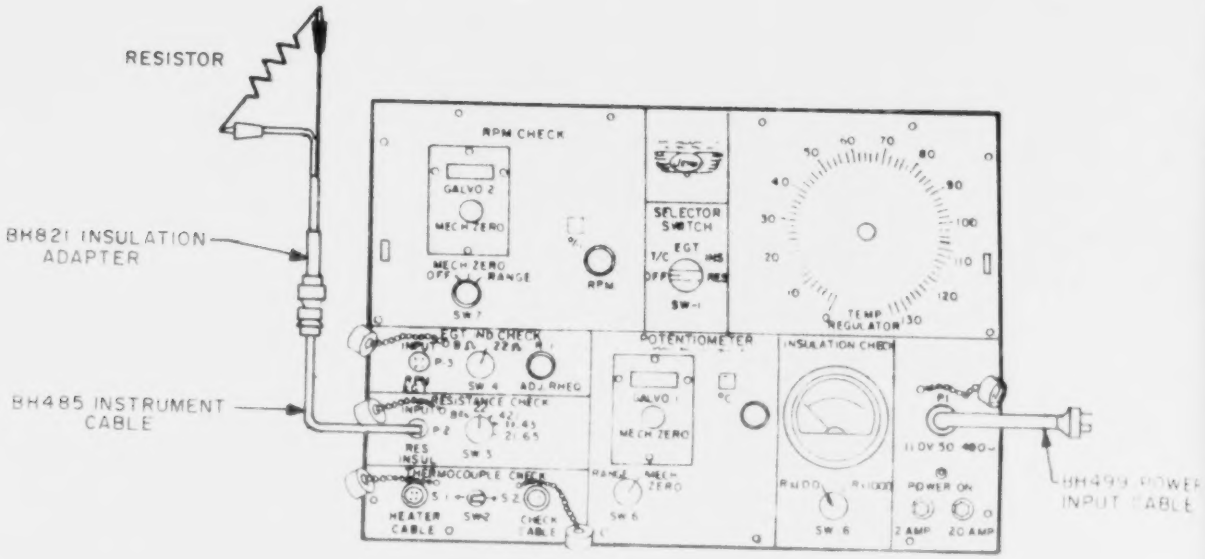


Figure 4–4. Insulation check circuit test.

e. Disconnect 1000 ohm resistor and keep leads of insulation check adapter from touching. Insulation check meter should read infinity (∞).

f. Place switch SW–8 in Rx1000 position. Insulation check meter should read infinity (∞).

g. Attach leads of insulation check adapter to a 100,000 ohm resistor. Insulation check meter should read 100 (100,000 ohms) ± 10 percent.

h. Disconnect 100,000 ohm resistor and short circuit leads of insulation check adapter by connecting together. Insulation check meter should read zero ohms.

i. Place switch SW–8 in Rx100 position. Insulation check meter should read zero ohms.

j. If readings taken in *d*, *g*, *h*, or *i* above deviate from stated proper readings, adjust insulation check circuit (para 4–40*b*, (1) through (8).

k. Place switch SW–1 in OFF position. Disconnect and stow all cables.

4–13. RESISTANCE CHECK Circuit Test. (Figure 4–5)

NOTE

Ground the tester with the pigtail ground wire in the power inlet cable before using the tester.

a. Turn TEMP. REGULATOR knob to zero and place switch SW–1 in OFF position. Connect power inlet cable to connector P–1 and to a 110 volt, 50 to 400 Hertz ac power source.

b. Connect instrument cable to connector P–2 and connect resistance check adapter to instrument cable.

c. Connect an 8 ohm ± 0.05 percent precision resistor to terminals of resistance check adapter.

NOTE

Precision resistor and components of tester must both be at ambient temperature. Any difference in temperature will introduce error into test procedure.

NOTE

If an 8 ohm ± 0.05 percent precision resistor is not available, a 22 ohm or 4.21 ohm ± 0.05 percent precision resistor may be substituted. Change setting of switch SW–3, as directed in *d* below, to position corresponding to value of substitute resistor.

4–14. Trouble Analysis.

Table 4–1 provides information useful in diagnosing and correcting unsatisfactory operation or failure of the tester or any of its components. Each trouble symptom is followed by a list of probable causes of trouble. The possible remedy recommended is described opposite the probable cause. Subsequent paragraphs in this section assume that the tester is properly connected to a 110 volt, 50 to 400 Hertz, ac power source and that switch positions, cable connections, etc, have been accomplished in accordance with paragraphs 2–4 through 2–18 for mode of operation attempted.

NOTE

The expression "no temperature indication" as used herein will indicate that galvanometer (GALVO–1) responds properly to applicable mechanical zero knob (para 2–2*d*). When switch SW–6 is placed in RANGE position, galvanometer (GALVO–1) does not respond to changes of setting on temperature selector knob. The expression "no rev per min indication" indicates the same circumstances regarding galvanometer (GALVO–2), switch SW–7, and R.P.M. knob.

NOTE

Always recheck test setup thoroughly before assuming tester is at fault.

All data on pages 4–4 thru 4–6 including figures 4–2, 4–3, 4–4, and 4–5 deleted.

Table 4–1. Troubleshooting

Malfunction	Probable cause	Corrective action
1. Galvanometer (GALVO–1) does not respond to temperature selector knob adjustments with switch SW–6 in RANGE position (all applicable modes of operation).	*a.* Defective switch SW–6.	*a.* Replace switch .
	b. Defective potentiometer.	*b.* Replace potentiometer (para. 4–42).
	c. Incorrect reference voltage to potentiometer.	*c.* See figure 4–15 and test following components of cable and printed circuit board assembly. Part No. BH1766; T2, CR8, CR9, CR10, CR11, CR12, CR13, C9, R14, R16, and R18. Replace defective components (para. 4–17).
2. Tester inoperative in all modes of operation.	*a.* Defective power inlet connector.	*a.* Replace power inlet connector (para. 4–47).
3. POWER ON light inoperative.	*a.* Defective transformer T2.	*a.* Replace transformer (para. 4–39*a*(2)).
	b. Defective cable and printed circuit board assembly, part no. BH1766.	*b.* Replace cable and printed circuit board assembly (para. 4–39).
	c. Defective wiring or connections.	*c.* Repair or replace wiring (para. 4–18*e*(5)).
4. Switch SW–1 in T/C position; no light beam in galvanometer (GALVO–1).	*a.* Defective transformer T2.	*a.* Replace transformer (para. 4–39*a*(2)).
	b. Defective cable and printed circuit board assembly, part no. BH1766.	*b.* Replace cable and printed circuit board assembly (para. 4–39).
	c. Defective wiring or connections.	*c.* Repair or replace wiring (para. 4–18*e*(5)).
	d. Defective switch SW–1.	*d.* Replace switch .
	e. Defective power lead cable to cable and printed circuit board assembly, part no. BH1766.	*e.* Repair or replace power lead cable (para. 4–17*e*(8) and (9)).
5. Galvanometer (GALVO–1) cannot be set to zero with mechanical zero knob.	*a.* Defective galvanometer.	*a.* Replace galvanometer (para. 4–41).
6. Galvanometer (GALVO–1) deflects erratically when reading in RANGE position.	*a.* Defective potentiometer.	*a.* Replace potentiometer (para. 4–42).
7. Heater probes will not heat; 20 amp fuse blown.	*a.* Temporary power line overvoltage.	*a.* Replace fuse and excite heater probes with TEMP REGULATOR knob. Continue operation if fuse does not blow.
	b. Heater cable connector defective or short in wiring.	*b.* Replace connector (para. 4–47).
	c. Defective voltage regulator.	*c.* Replace voltage regulator (para. 4–38).

Table 4-1. Troubleshooting—Continued

Malfunction	Probable cause	Corrective action
8. Heater probes will not heat; 20 amp fuse not blown.	*a.* Defective voltage regulator.	*a.* Replace voltage regulator (para. 4-38).
	b. Defective heater probe or heater cable.	*b.* Replace heater probe or heater cable.
9. No temperature indication with switch SW-2 in S-1 position.	*a.* Defective switch SW-2.	*a.* Replace switch (para. 4-46).
	b. Defective wiring in thermocouple circuit.	*b.* Repair or replace wiring (para. 4-18*e*(2)).
	c. Heater cable connector defective.	*c.* Replace heater cable.
10. No temperature indication with switch SW-2 in S-2 position.	*a.* Defective wiring in check cable thermocouple circuit.	*a.* Repair or replace wiring (para. 4-18*e*(2)).
	b. Defective switch SW-2.	*b.* Replace switch (para. 4-46).
11. Galvanometer (GALVO-1) cannot be set to zero with potentiometer R-1.	*a.* Defective switch SW-1.	*a.* Replace switch .
	b. Open potentiometer (°C scale).	*b.* Replace potentiometer (para. 4-42)
	c. Defective potentiometer R-1.	*c.* Replace potentiometer (para. 4-44).
	d. Incorrect EGT indicator circuit reference voltage.	*d.* See figure 4-15 and test following components of cable and printed circuit board assembly, part no. BH1766; T2, CR1, CR2, CR3, CR4, CR5, CR6, CR7, CR8, R2, R3, R13, and R19. Replace defective components (para. 4-17).
12. Galvanometer (GALVO-1) cannot be set to zero by adjusting resistance spool in aircraft.	*a.* Defective reference resistor.	*a.* See figure 4-15 and test following components: R28, R29, R30, R31, R32, and R45. Replace defective components (para. 4-17).
	b. Defective printed circuit board assembly, part no. BH1760.	*b.* Replace printed circuit board assembly .
	c. Defective cable and printed circuit board assembly, part no. BH1766.	*c.* Replace cable and printed circuit board assembly (para. 4-39).
	d. Defective switch SW-3.	*d.* Replace switch .
13. INSULATION CHECK meter will not zero with insulation check adapter leads shorted and switch SW-8 in either position.	*a.* Defective insulation check meter.	*a.* Replace meter (para. 4-43).
	b. Defective switch SW-8.	*b.* Replace switch .
	c. Defective printed circuit board assembly, part no. BH1760.	*c.* Replace printed circuit board assembly .
	d. Circuit out of adjustment.	*d.* Adjust circuit .
	e. Defective adjustment potentiometer.	*e.* See figure 4-15 and test R38, R40, R42, and R44. Replace defective components (para. 4-18*e*).

Table 4-1. Troubleshooting—Continued

Malfunction	Probable cause	Corrective action
	f. Defective resistor.	*f.* See figure 4-15 and test R33, R34, R35, R36, R39, R41, R42, and R43. Replace defective components (para. 4-18*e*).
	g. Defective switch SW-1.	*g.* Replace switch.
	h. Incorrect reference voltage.	*h.* See figure 4-15 and test following components: C7, C8, CR1, CR2, CR3, CR4, CR5, CR6, CR7, R2, R3, R13, R19, and T2. Replace defective components (para. 4-17*d*).
14. No light beam in galvanometer (GALVO-2).	*a.* Defective switch SW-7.	*a.* Replace switch.
	b. Defective wiring or connections.	*b.* Repair or replace wiring (para. 4-18*e*(5)).
	c. Defective winding on transformer.	*c.* Replace transformer (para. 4-27).
15. Galvanometer (GALVO-2) cannot be set to zero with mechanical zero knob.	*a.* Defective galvanometer (GALVO-2).	*a.* Replace galvanometer (para. 4-20).
16. No RPM indication with switch SW-7 in RANGE position.	*a.* Defective relay.	*a.* See figure 4-15 and test relay RLY1. Replace if defective (para. 4-27*b*).
	b. Defective capacitor.	*b.* See figure 4-15 and test capicators C3, C4A, C4B, and C6. Replace defective components (para. 4-27*e*(7)).
	c. Defective resistor.	*c.* See figure 4-15 and test resistors R6, R7, R8, R11, R12, R17, R20, R21, R22, and R37. Replace defective components (para. 4-27*e* (6)).

Section III. REPAIR PROCEDURES

4-15. General.

This section contains descriptions of components and instructions for authorized field repair or replacement. Refer to Section IV for alignment that might be necessary before reassembly.

WARNING

Remove power from the tester before any disassembly procedure.

4-16. Voltage Regulator. (Figure 4-6).

The voltage regulator (7) provides a means for regulating the voltage to the heaters in the heater probes. The voltage regulator is a brush-type autotransformer. The voltage regulator has a 20-ampere rating with a voltage output variable from zero volts to approximately 130 percent of line (input) voltage available at the power inlet connector P-1.

a. Removal.

(1) Remove deck assembly (para 4-32*a*).

(2) Disconnect wiring at rear of voltage regulator (7).

(3) Remove bolts (8) and lockwashers (9). Remove voltage regulator (7) from box assembly (18).

b. Disassembly. Disassembly of voltage regulator is not required.

c. Cleaning.

(1) Use a soft brush or a stream of clean, dry compressed air (30 psi maximum) to remove dust or dirt.

CAUTION

Do not allow dry cleaning solvent to run into the interior of voltage regulator. Damage to phenolic and other insulating compounds will result.

(2) Use a clean, lint-free cloth lightly dampened with dry cleaning solvent (item 1, table 1-1) to remove accumulations of grease or other foreign matter.

d. Inspection and Repair.

(1) Inspect phenolic boards for cracks, loose terminals, and stripped terminal screws. Replace terminal screws if stripped or damaged. Replace voltage regulator if terminal board is damaged to a degree where operation is impossible or hazardous, or if threaded terminals are stripped.

(2) Rotate control shaft through its normal range of operation and check for smooth operation. Replace voltage regulator if sticking or binding is observed or if control shaft will not make its full travel of approximately 335 degrees.

(3) Observe windings for obvious damage, cracks in core materials, and short circuits between adjacent windings. Replace voltage regulator if any of these conditions exist.

(4) Replace voltage regulator if control shaft is broken or scored so that knob (3) will not fit properly without play or slippage.

4-17. BH1766 Printed Circuit Board Assembly and Cable (Figure 4-6).

The printed circuit board (16) with cable provides reference voltages utilized by the potentiometer, resistance check, and insulation check circuits. Reference voltages supplied are regulated within ±0.4 volts by zener diode circuitry. Secondary windings on the transformer supply ac voltages for conversion to dc and power for the POWER ON light and the GALVO-1 galvanometer light.

a. Removal.

(1) Remove deck assembly (para. 4-32*a*).

(2) Disconnect wiring from voltage regulator (7).

(3) Remove screws (17) and remove cable and printed circuit board assembly (16) from box assembly (18).

b. Disassembly (Figure 4-7)

(1) Remove rectifiers (2) and fuse (13) from fuse and rectifier holders.

(2) Remove transformer (11) by removing nuts (23) from bottom of printed circuit board (24) and unplugging transformer.

(3) Unsolder one lead of the following components (fig. 4-15):

(a) R2 or C7 at common junction.

(b) C9 or CR10, and CR13 at common junction.

(c) R13, CR1 and R3.

NOTE

Normal disassembly procedures do not go beyond this point. Remaining components can be tested in place by contacting accessible terminals with test equipment. Replace defective components on an as required basis.

c. Cleaning.

(1) Use a soft brush to remove accumulations of dust and dirt.

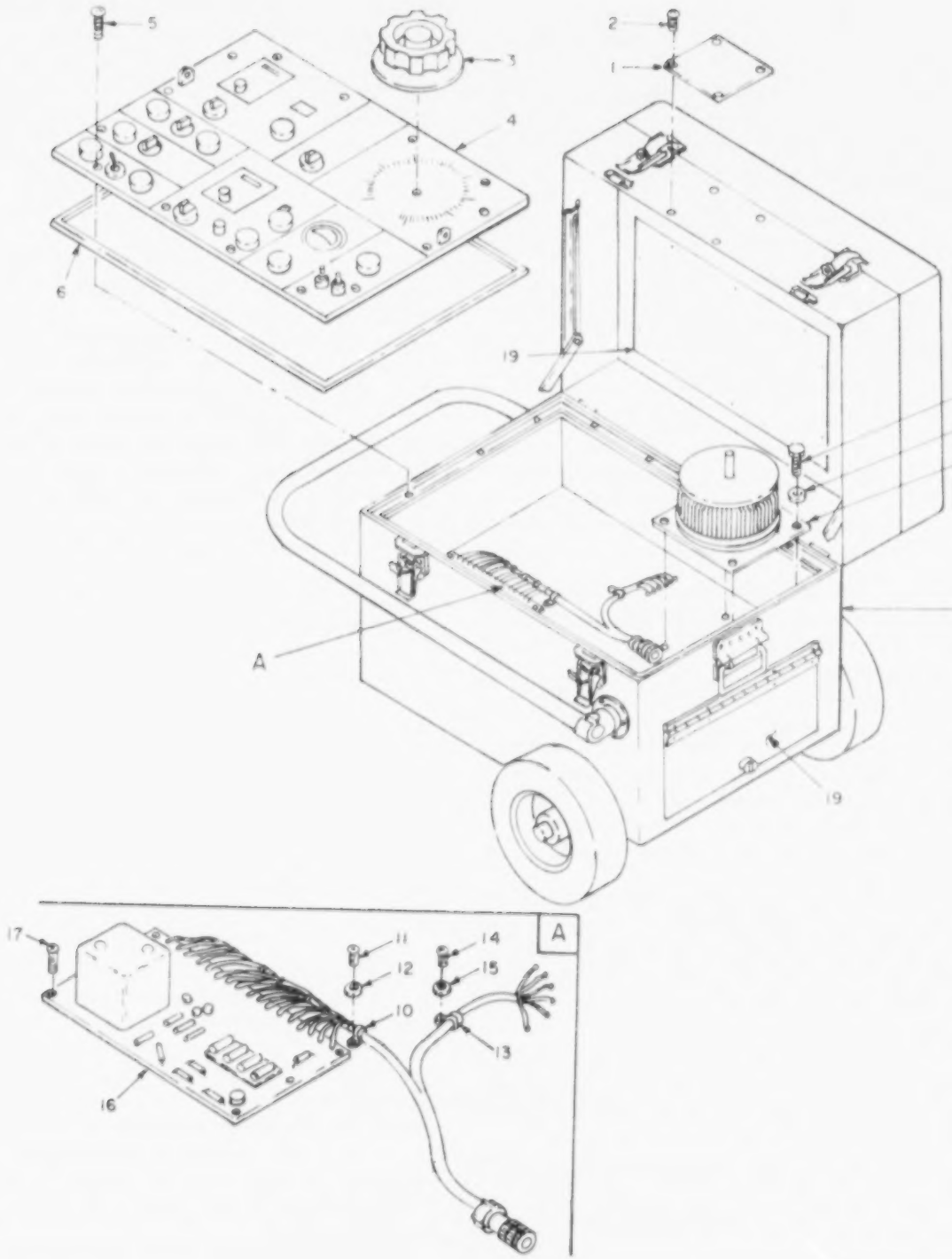
(2) Use a cloth dampened in dry cleaning solvent (item 1, table 1-1) to remove foreign matter.

d. Inspection and Testing.

(1) Inspect transformer for signs of external damage, bent or broken pins on connector, paint discoloration, and potting compound leakage.

(2) Inspect printed circuit board for cracks, separation, carbonized paths between elements, and security of component mounting. Inspect for cold solder joints and corrosion.

(3) Inspect components on printed circuit board for mounting security, damage, broken leads, or signs of overheating.



Key to figure 4–6

1. Nameplate
2. Screw
3. Knob
4. Deck Assembly
5. Screw
6. Gasket
7. Voltage Regulator
8. Bolt
9. Washer

Figure 4–6. Tester major components.

10. Clamp
11. Screw
12. Washer
13. Clamp
14. Screw
15. Washer
16. Printed Circuit Board
17. Screw
18. Box Assembly
19. Instruction Plate

Figure 4-6—Continued.

(4) Inspect fuse and rectifier holders for damage, mounting security, and proper tension of clips.

(5) Inspect wiring harness for breaks in insulation or conductors, shrinking of insulation or other signs of overheating in wiring, and damage to connector.

(6) Use a suitable tester to test zener diodes and rectifiers. Replace any defective components.

(7) Use a decade resistance bridge or other precision resistance checker and make sure all resistors are within tolerance.

(8) Check capacitors with a capacitor checker.

(9) Use a suitable continuity checker to test for continuity of windings and check insulation resistance between windings and transformer case with a megger.

e. Repair.

(1) Straighten connector pins on transformer with needle nose pliers or suitable tube pin straightener. Replace transformer if pins are broken or show signs of shearing after straightening. External damage is permissible providing case remains sealed, proper mounting is not affected, and/or windings are not damaged as described in *d*(9) above.

(2) Replace transformer if paint is scorched (brown or yellowish areas) or if potting compound is leaking at seams or openings.

(3) Replace printed circuit board if any of the following conditions exist:

(a) Separation of plies in board material.

(b) Cracks, over 1/8 inch in length, or extending into component mounting area or extending into a printed conductor path.

(c) Carbonized paths between components, printed conductors, or mounting areas.

(d) More than one printed conductor cut, damaged, or separated from board.

(e) Separation of terminals from board.

(4) Single printed conductors may be replaced with point-to-point wiring if terminals at each end of defective printed conductor will accommodate additional wire. Use No. 20 AWG or larger insulated copper wiring for replacement purposes.

(5) Separate all components at cold soldered or corroded joints. Clean terminals and conductors of all solder and corrosion. Tin all surfaces to be soldered and resolder joint.

CAUTION

Provide a heat sink on conductors between end of lead of zener diode and precision resistor bodies to prevent damage from overheating when soldering.

(6) Replace any component on printed circuit board with broken or scored leads. Any component showing definite signs of overheating should be replaced regardless of test indication.

CAUTION

Install rectifier holders facing in proper direction. Negative (-) end of outside rectifier holders face cable side of printed circuit board; positive (+) end of inside rectifier holders also face the cable side.

(7) Replace fuse and rectifier holders if damaged. Resolder terminals if corroded or loose. Clips may be carefully pinched together if required to restore tension. Replace rectifier holders if worn or damaged to prevent rectifiers being installed facing in wrong direction.

(8) Replace power lead cable if connector is damaged or if wiring shows deterioration of insulation.

(9) Single wires may be replaced in power lead cable. Use same size and type of wire. Use white wire if proper color is not available and color code insulation terminal with color(s) of original wire.

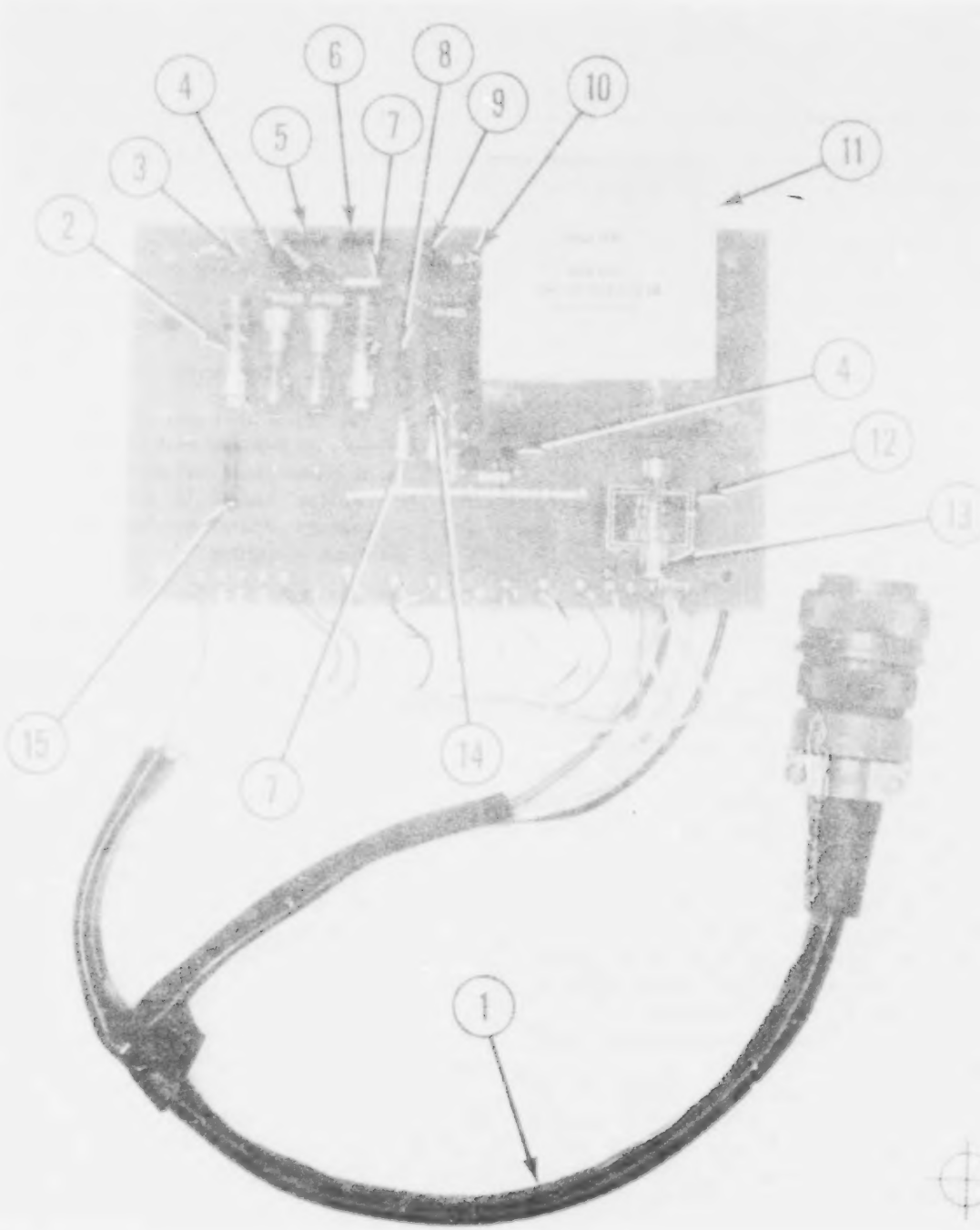
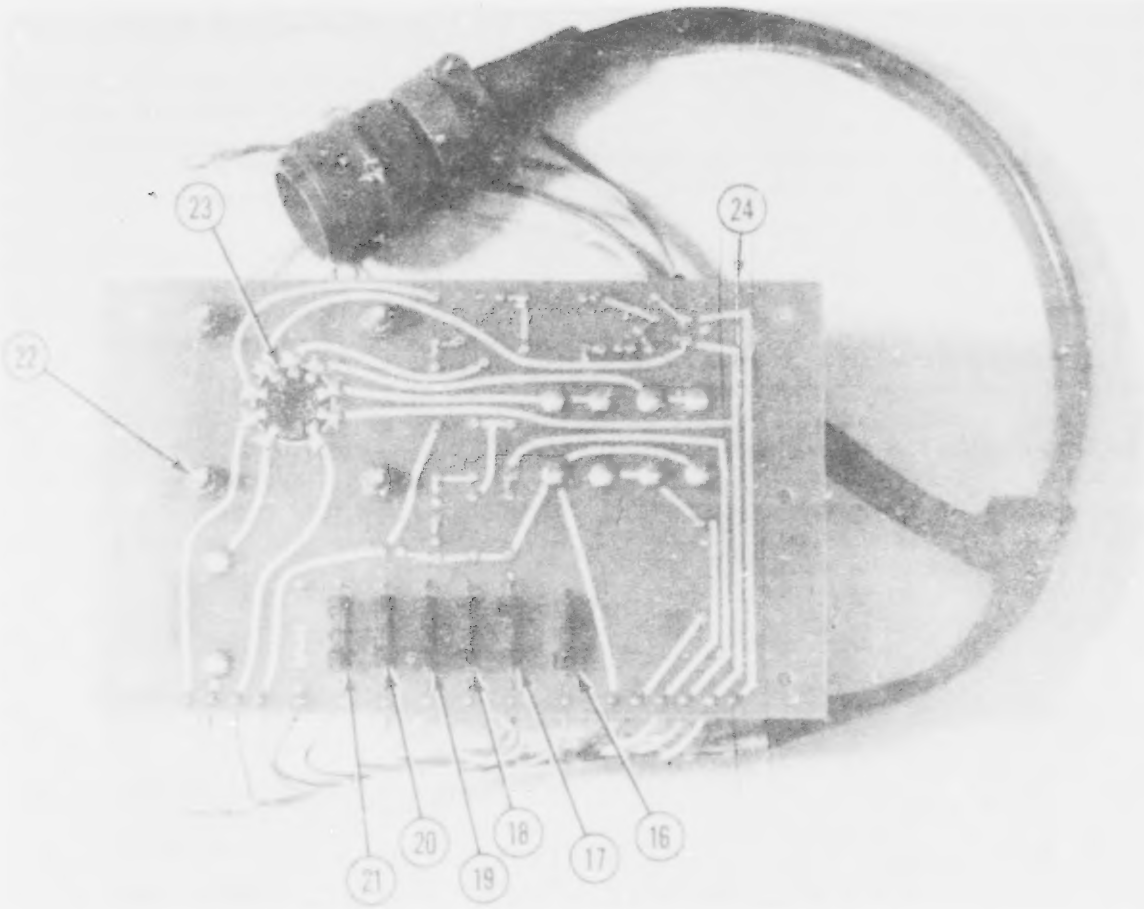


Figure 4-7. BH1766 circuit board assembly (sheet 1 of 2).



Key to Figure 4–7

1. Power Lead Cable
2. Rectifier
3. Zener Diode
4. Zener Diode
5. Resistor
6. Resistor
7. Capacitor
8. Resistor
9. Resistor
10. Zener Diode
11. Transformer
12. Holder
13. Fuse
14. Resistor
15. Resistor
16. Resistor
17. Resistor
18. Resistor
19. Resistor
20. Resistor
21. Resistor
22. Nut
23. Socket
24. Printed Circuit Board

Figure 4–7. BH1766 circuit board assembly (sheet 2 of 2).

CAUTION

Provide a heat sink on leads between terminal and case of zener diodes when soldering to prevent damage to diode.

(10) Replace zener diodes and rectifiers if testing proves them defective.

CAUTION

Provide a heat sink on leads between terminal and resistor when soldering to prevent damage to resistor.

(11) Replace any circuit board resistors not within tolerance.

(12) Replace capacitors with broken or damaged leads and any capacitor which shows excessive leakage or shorted condition. Replace capacitor if capacity shown on tester is below rated value.

(13) Replace transformer if any winding is open, shorted to another winding, or shorted to the case.

4–18. BH1760 Printed Circuit Board Assembly (Figure 4–8).

The circuit board assembly contains adjustable potentiometers used for adjusting the insulation check circuit and precision resistors used in the insulation check circuit and other circuits in the tester.

a. Removal.

(1) Remove deck assembly (para. 4–32).

(2) On printed circuit board assembly (49) locate terminal designators adjacent to solder terminals and make sure connecting wire attached to solder terminals is marked with a corresponding number or letter. Identify and tag any unmarked wires.

(3) Unsolder all connecting wiring from printed circuit board assembly.

(4) Remove attaching screws (50) and spacers (53) and remove printed circuit board assembly from deck (128).

b. Disassembly. No disassembly of the printed circuit board assembly is required. Individual components can be tested in place by con-

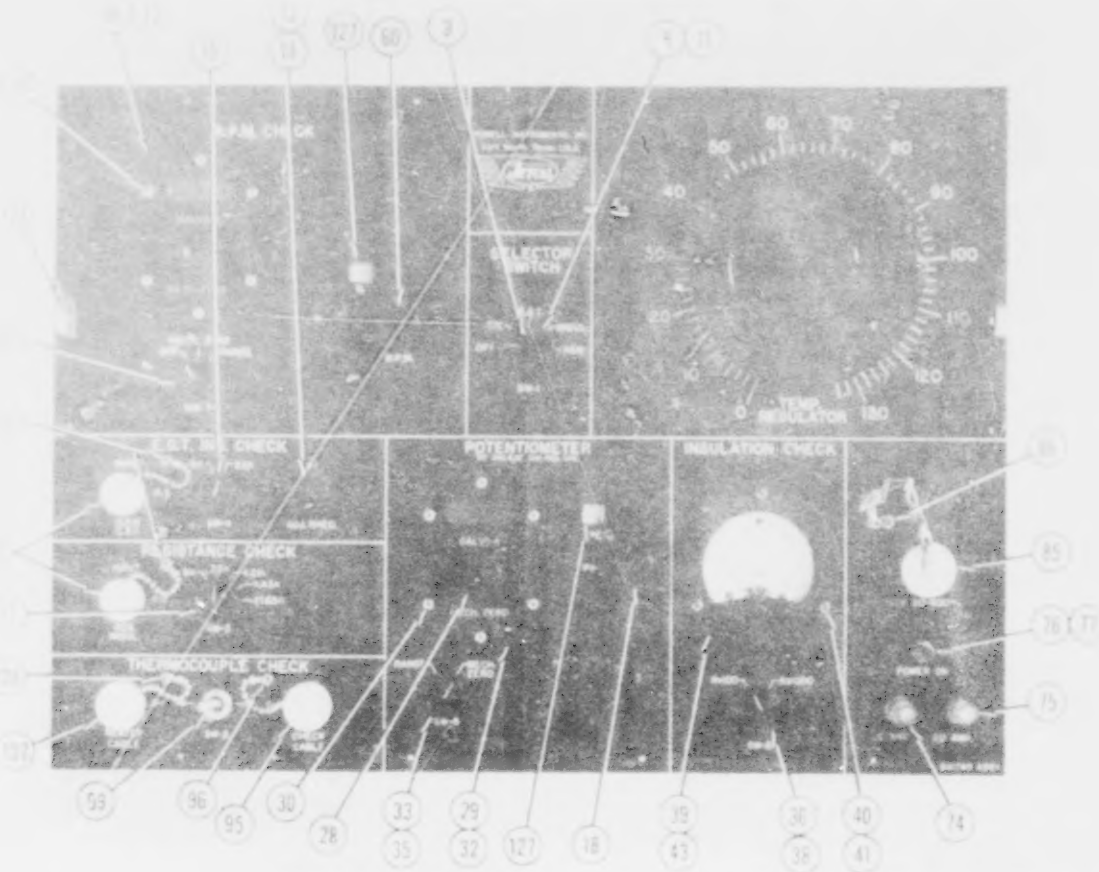


Figure 4–8. Deck Assembly (sheet 1 of 4).

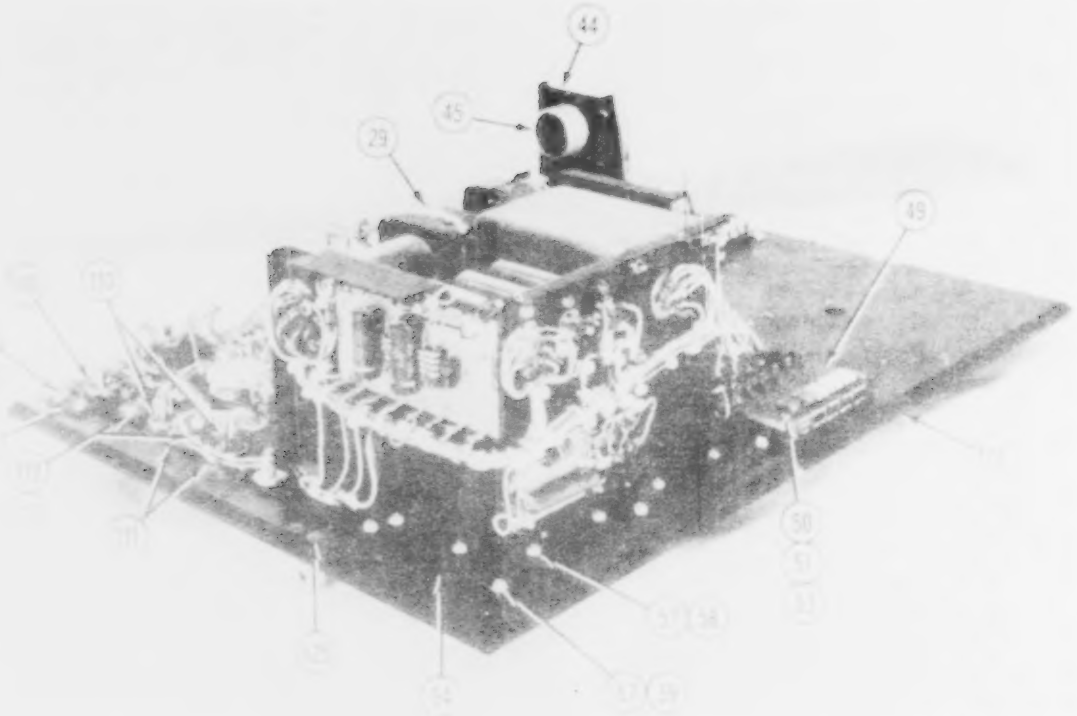


Figure 4-8. Deck Assembly (sheet 2 of 4).

tacting accessible terminals and replaced on an as required basis.

c. Cleaning.

(1) Use a soft brush to remove accumulations of dust and dirt.

(2) Use a cloth dampened with dry cleaning solvent (item 1, table 1-1) to remove foreign matter.

d. Inspection and Testing.

(1) Inspect printed circuit board for cracks, separation, carbonized paths between elements, and security of components.

(2) Inspect for cold solder joints and corrosion at all solder terminals and resistor leads.

(3) Inspect all components for damage, broken leads, or signs of overheating.

(4) Use a decade resistance bridge or other precision resistance checker to make sure all resistors are within tolerance.

(5) Inspect attaching cable harness on deck assembly for broken wires and condition of insulation. Inspect insulation for signs of overheating in cable harness.

e. Repair.

(1) Replace printed circuit board if any of the following conditions exist:

(a) Separation of plies in board material.

(b) Cracks, over 1/8 inch in length, or extending into component mounting area or extending into a printed conductor path.

(c) Carbonized paths between components, printed conductors, or mounting areas.

(d) More than one printed conductor cut, damaged, or separated from board.

(e) Separation of terminals from board.

(2) Single printed conductors may be replaced with point to point wiring if terminals at each end of defective printed conductor will accommodate additional wire. Use No. 20 AWG or larger insulated copper wiring for replacement purposes.

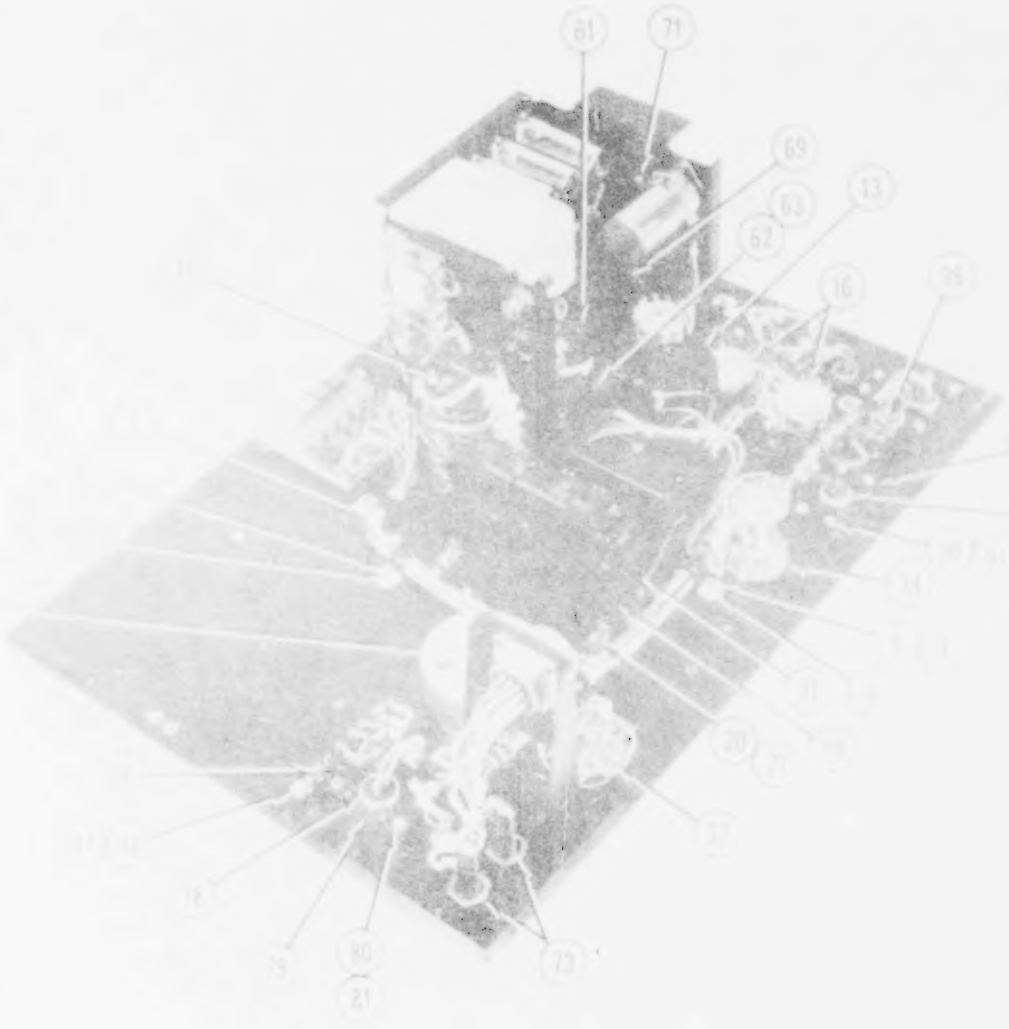


Figure 4-8. Deck Assembly (sheet 3 of 4).

(3) Separate all components at cold soldered or corroded joints. Clean terminals and conductors of all solder and corrosion. Tin all surfaces to be soldered and resolder joint.

CAUTION

Provide a heat sink on conductors between end of lead and precision resistor bodies to prevent damage from overheating when soldering.

(4) Replace resistors with nicked, scored, or broken leads. Any precision resistor showing signs of overheating should be replaced and source of trouble determined.

(5) Repair broken wiring in cable harness as follows:

(a) If slack in wire beyond end of cable harness permits, bare 1/4 inch of wire at break and install in terminal in place of broken end.

(b) If insufficient slack is present, splice a suitable length of same size and color wire at break and cover splice with 3/32- or 1/8-inch plastic tubing or an approved electrical tape. If same color wire is not available, use white wiring and color code insulation on terminal end with color(s) of original wire.

(c) If wiring break is detected within cable harness and is readily located, repair as in (b) above. Do not splice more than once in any conductor.

(d) If wiring break is detected within cable harness and not readily located, replace wire as outlined in (6) below.

(e) Cover any minor damage to wiring insulation by covering individual wires with 3/32- or 1/8-inch plastic tubing.

(6) Wiring having burned or withered insulation will be repaired as follows:

(a) Trace affected wire to its origin. Unclamp and untie cable harness along entire length of affected wire.

(b) Examine other wires in cable harness for heat damage to insulation.

(c) Replace entire length of all damaged wiring, using same size and color wire. If same color wire is not available, use white wiring and color code insulation on both ends with color(s) of original wire.

(d) Bundle wiring along original path of cable harness and lace in accordance with TM 55–1500–323–25 at 1-inch intervals.

(7) Replace potentiometers if erratic action is noted as adjusting screw is turned.

4–19. Galvanometer (GALVO–1) (Figure 4–8).

a. Removal.

(1) Remove screws which secure galvanometer (29) in deck (128).

(2) Carefully remove galvanometer from opening in deck as far as attached wiring will permit.

CAUTION

Do not strain or break wiring at rear of galvanometer.

(3) Remove screw and dust cover from rear of galvanometer. Provide several thicknesses of cloth or other suitable cover for top of deck.

CAUTION

Failure to provide cover for deck may result in damage from melted solder or hot soldering iron.

(4) Identify and tag wiring. Unsolder and remove wiring from terminals in galvanometer. Remove galvanometer and dust cover.

b. Disassembly and Repair. No disassembly or repair is required. Replace on an as required basis.

4–20. Galvanometer (GALVO–2) (Figure 4–8).

a. Removal. Remove galvanometer (69) in accordance with paragraph 4–19*a*.

b. Disassembly and Repair. Refer to paragraph 4–19*b*.

4–21. Potentiometer (°C) (Figure 4–8).

a. Removal.

(1) Remove deck assembly (para. 4-32*a*.

(2) Loosen setscrew and remove knob from potentiometer (19).

(3) Identify and tag wiring. Unsolder and remove wiring from potentiometer.

(4) Remove screws (30) which secure potentiometer to deck (128). Remove potentiometer.

NOTE

Remove gasket (O ring) only if damaged.

b. Disassembly and Repair. No disassembly or repair is required. Replace on an as required basis.

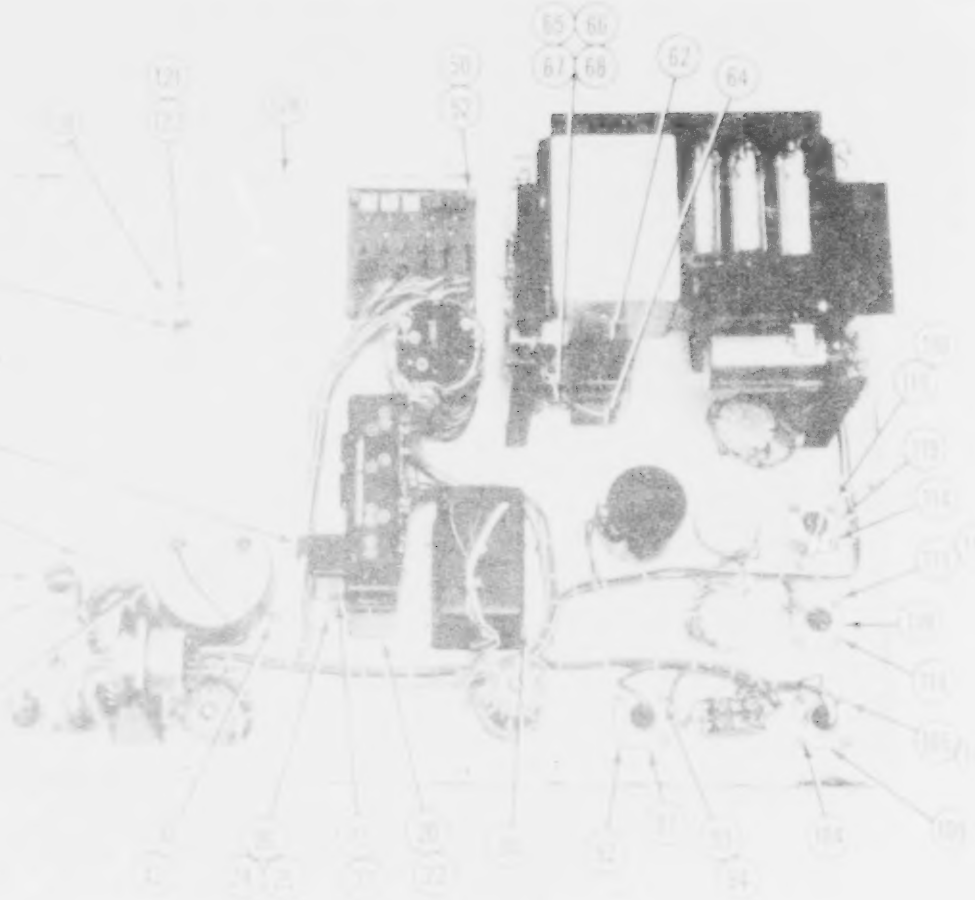
4–22. Insulation Check Meter (Figure 4–8).

a. Removal.

(1) Remove screws which secure meter (39) to deck (128).

CAUTION

Failure to provide cover for deck may result in damage from melted solder or hot holdering iron.



Key to Figure 4-8

1. Wiring Loom
2. Clamp
3. Screw
4. Washer
5. Clamp
6. Screw
7. Washer
8. Knob
9. Mount
10. Switch
11. Boot
12. Knob
13. Potentiometer Resistor
14. Boot
15. Knob
16. Switch
17. Boot
18. Knob
19. Potentiometer
20. Screw
21. Washer
22. Spacer
23. Seal Plate
24. Seal Screw
25. Seal Screw
26. Nut
27. Packing
28. Knob
29. Galvanometer
30. Screw
31. Nut
32. Gasket
33. Knob
34. Switch
35. Boot
36. Knob
37. Switch
38. Boot
39. Meter
40. Screw
41. Washer
42. Nut
43. Gasket
44. Bracket
45. Connector
46. Terminal Board
47. Screw
48. Washer

Figure 4-8. Deck Assembly (sheet 4 of 4).

49. Printed Circuit Board
50. Screw
51. Washer
52. Nut
53. Spacer
54. RPM Check Assembly
55. Knob
56. Boot
57. Screw
58. Nut
59. Lockwasher
60. Knob
61. Potentiometer
62. Screw
63. Washer
64. Spacer
65. Seal Plate
66. Seal Screw
67. Nut
68. Packing
69. Galvanometer
70. Seal Screw
71. Nut
72. Gasket
73. Fuseholder
74. Fuse
75. Fuse
76. Lampholder
77. Lamp
78. Connector
79. Connector Mount
80. Screw
81. Washer
82. Seal Screw
83. Seal Screw
84. Nut
85. Dust Cover
86. Screw
87. Gasket
88. Connector
89. Connector Mount
90. Screw
91. Washer
92. Seal Screw
93. Seal Screw
94. Nut
95. Dust Cover
96. Gasket
98. Switch
99. Boot
100. Connector
101. Connector
102. Screw
103. Washer
104. Seal Screw
105. Seal Screw
106. Nut
107. Dust Cover
108. Screw
109. Gasket
110. Connector
111. Connector Mount
112. Screw
113. Washer
114. Seal Screw
115. Seal Screw
116. Nut
117. Dust Cover
118. Screw
119. Gasket
120. Seal Plate
121. Seal Screw
122. Nut
123. Packing
124. Stop Arm Support
125. Screw
126. Screw
127. Window
128. Machined Deck

Figure 4-8—Continued

(2) Remove meter from deck as far as attached wiring will permit. Identify and tag wiring. Provide several thicknesses of cloth or other cover for top of deck.

(3) Unsolder and remove wiring from rear of meter. Remove meter (39).

b. Disassembly and Repair. No disassembly or repair is necessary. Replace on an as required basis.

4-23. Potentiometer (R-1) (Figure 4-8).

The potentiometer (13) is a wirewound, continuously variable potentiometer with a value of 0 to 50 ohms. The potentiometer is used in determining error in the EGT indicator circuit of the aircraft system. Resistance tolerance of the potentiometer is ± 5 percent and variation from linear adjustment tolerance is ± 0.3 percent.

a. Removal.

(1) Remove deck assembly (para. 4-32).

(2) Identify and tag wiring. Unsolder and remove wiring from rear of potentiometer (13).

(3) Loosen setscrew and remove knob (18) from potentiometer.

(4) Remove seal nut, which secures potentiometer to deck (128). Remove potentiometer.

b. Disassembly. No disassembly is required.

c. Cleaning.

(1) Clean exterior of potentiometer with cloth or soft brush.

(2) Remove any foreign matter with a cloth dampened with dry cleaning solvent (item 1, table 1-1).

d. Inspection and Testing.

(1) Inspect terminals for corrosion.

(2) Inspect case for cracks or other damage.

(3) Rotate shaft to one extreme of its travel.

(4) Rotate shaft to other extreme of its travel, counting number of turns necessary to complete travel. Ten complete turns should be required, less no more than 15 degrees.

(5) Connect an ohmmeter across CW and CCW terminals of potentiometer. Reading should be 50 ohms ± 5 percent.

(6) Turn shaft to extreme counterclockwise position. Connect ohmmeter across CCW and SLIDER terminals.

(7) Turn shaft slowly through its range to extreme clockwise position, simultaneously observing ohmmeter. Replace potentiometer if ohmmeter shows open circuit at any time or if any indication is given other than a smooth flow from minimum to maximum value. Sudden jumps to higher values of resistance followed by a return to lower value indicates dirt or corrosion on element or slider. A fairly consistent reading on ohmmeter over a large range of shaft rotation indicates a short circuit over that portion of the element.

e. Repair.

(1) Remove small areas of corrosion with a fine file and tin area after all evidence of corrosion has been removed. Replace potentiometer if corrosion has weakened terminal or extends into body of potentiometer.

(2) Replace potentiometer if conditions outlined in *d* above exist.

4–24. Rotary Switches (Figure 4–8).

The rotary switches are SW–1 (10), SW–3 (16), SW–4 (16), SW–6 (34), SW–7 (12, fig 4–9), and SW–8 (37, fig. 4–8). With the exception of SW–1, all rotary switches are phenolic wafer, open construction type. Switch SW–1 is enclosed construction. All rotary switches have positive detent action in contact positions and are break-before-make type.

a. Removal.

(1) Remove deck assembly (para. 4–32).

(2) Identify and tag wiring. Unsolder and remove wiring from rotary switch.

(3) Loosen setscrew and remove knob from rotary switch.

(4) Remove seal nut which secures rotary switch to deck. Remove switch.

b. Disassembly. No disassembly is required. Replace entire rotary switch if defective.

c. Cleaning.

(1) Use a fine camel's hair brush to remove foreign matter from rotary switches.

NOTE

Steps (2) through (4) do not apply to SW–1.

WARNING

Use trichloroethylene only in adequately ventilated area. Avoid prolonged or repeated breathing of vapor. Avoid prolonged or repeated contact with skin.

(2) Use a cotton swab or camel's hair brush dipped in trichloroethylene (item 2, table 1–1) or other suitable solvent on contacts and wipers.

CAUTION

Do not apply any pressure to spring-type contacts. Any weakening of tension will cause premature failure of rotary switch.

(3) Place a drop or two of trichloroethylene (item 2, table 1–1) between jaws of contacts and rotate rotary switch through its entire range several times to free any foreign matter in contacts.

(4) Use a dry cotton swab or pipe cleaner to remove any residue from wiper.

d. Inspection and Testing.

NOTE

Steps (1) and (2) do not apply to SW–1.

(1) Make sure all terminals are attached firmly to phenolic wafer and will not turn.

(2) Make sure detent action is positive at each position and that wiper is securely attached to rotating portion of wafer.

(3) Using an ohmmeter capable of accurately reading values of 1 ohm, check all contacts for a closed circuit value of less than 1 ohm and an open circuit value of at least 100 megohms.

e. Repair. Replace rotary switch if any of the conditions described in *d* above exist.

4–25. Toggle Switch (Figure 4–8).

Selector switch (SW–2) (98) is a double pole, double throw toggle switch used to transfer the thermocouple input of the potentiometer circuit between heater cable and check cable connectors.

a. Removal.

(1) Remove deck assembly (para. 4–32).

(2) Identify and tag wiring. Unsolder and remove wiring from toggle switch (98).

(3) Unscrew and remove seal nut (99) from toggle switch. Remove toggle switch from bottom of deck (128).

b. Disassembly. No disassembly is required.

c. Cleaning.

(1) Clean switch with a soft brush.

(2) Use a cloth moistened in dry cleaning solvent (item 1, table 1–1) to remove foreign matter.

d. Inspection and Testing.

(1) Operate toggle switch several times. Toggle action should be positive with an audible click as toggle switch operates.

(2) Make sure terminals and attaching rivets are secure and will not turn or move.

(3) Inspect switch terminals for corrosion.

(4) Using an ohmmeter capable of accurately reading values of 1 ohm, check switch contacts for a closed circuit value of less than 1 ohm and an open circuit value of at least 100 megohms.

(5) Inspect shank of toggle switch and attaching hardware for damaged threads.

e. Repair. Replace toggle switch if any of the conditions described in *d* above exist.

4–26. Connectors. (Figure 4–8)

NOTE

Except for location of the connectors in the deck and the number of solder terminals, removal procedures are identical.

a. Removal.

(1) Remove deck assembly (para. 4–32).

(2) Identify and tag wiring. Unsolder and remove wires from connector (78).

(3) Remove screws and lockwashers that secure mount (9) (if applicable) and connector to deck. Remove mount and connector.

NOTE

Remove gasket only if damaged.

(4) Remove connectors (88, 100, and 110) as outlined in (2) and (3) above.

b. Disassembly. No disassembly is required.

c. Repair. No repair is required except to straighten bent pins.

4–27. RPM Check Assembly (Figure 4–9).

The RPM check assembly provides a pulsating dc output independent of voltage variations in tachometer output, but proportional to frequency of tachometer output. The RPM check assembly consists of a resistance-capacitance coupled, two-stage, low-frequency amplifier used to drive a sensitive relay at the engine tachometer generator frequency. As the tachometer generator shaft rotates, the relay contacts open and close, providing pulsating dc to a galvanometer (GALVO–2) proportional to the engine tachometer generator frequency. As the frequency increases, the average dc component of the pulsating dc increases. The potentiometer connected to the RPM knob provides an adjustable dc voltage to a galvanometer (GALVO–2) used to balance the output signal from the RPM check assembly. When zero indication is obtained on GALVO–2, percent RPM can be read on the % scale.

a. Removal.

(1) Remove deck assembly (para. 4–32).

(2) Remove galvanometer (69, fig. 4–8) (para. 4–19*a*).

(3) On RPM check assembly (54, fig. 4–8), locate terminal designations adjacent to solder terminals and make sure attached wiring is coded to correspond with terminal designations. Identify and tag any unmarked wiring.

(4) Unsolder all connecting wiring from RPM check assembly.

(5) Loosen setscrews and remove knobs from potentiometer (61) and selector switch (12, fig. 4–9). Remove seal nut from selector switch.

(6) Remove screws (57, fig. 4–8) and lockwashers (59 which secure RPM check assembly (54) to deck (128). Remove RPM check assembly.

b. Disassembly (Figure 4–9).

(1) Unlatch clamp (19) and remove relay (1) by unplugging from socket.

(2) Remove tube shields and tubes (para. 4–36).

NOTE

Normally, disassembly beyond this point is not accomplished except on an as required basis. Com-

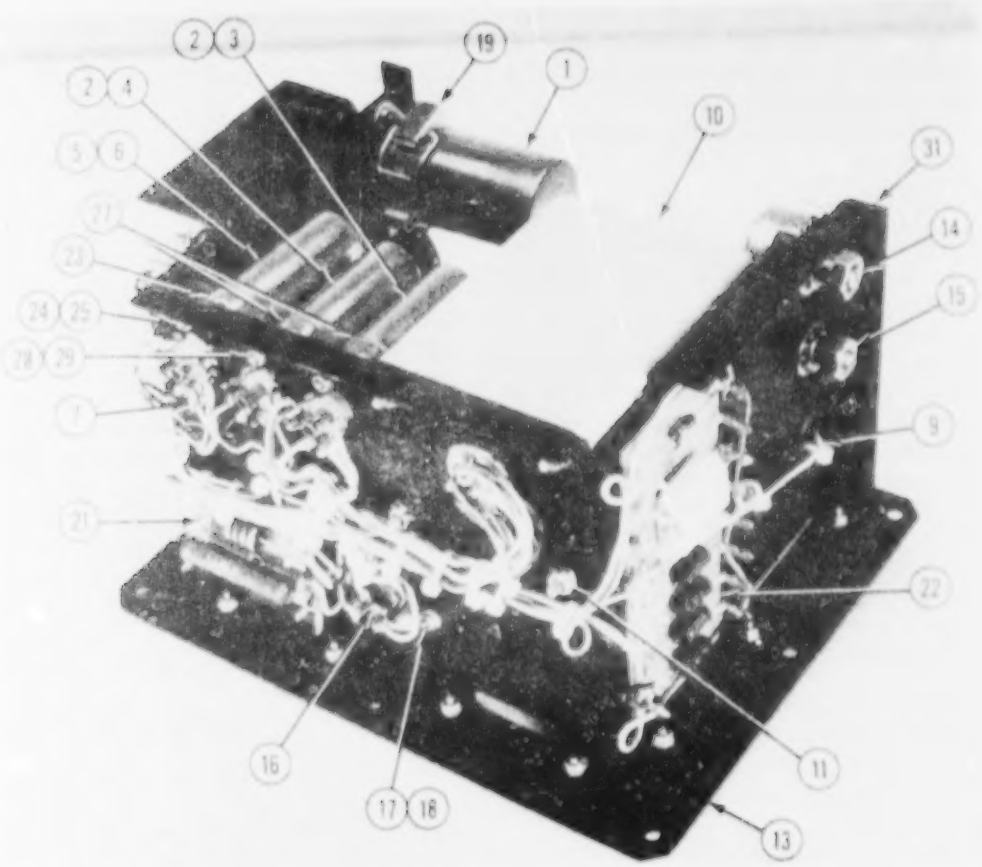


Figure 4–9. BH146 Takcal assembly (sheet 1 of 2).

ponents can be tested in place by isolating terminals or leads of component from the circuit to which they are connected and testing with suitable test equipment.

(3) Remove remaining components as required by unsoldering wires and removing attaching hardware.

c. Cleaning.

(1) Use a camel's hair or other suitable soft brush to remove dust and dirt from components.

(2) Use a cloth or swab dampened in dry cleaning solvent, (item 1, table 1–1), or other approved solvent to remove adhering foreign matter.

d. Inspection and Testing.

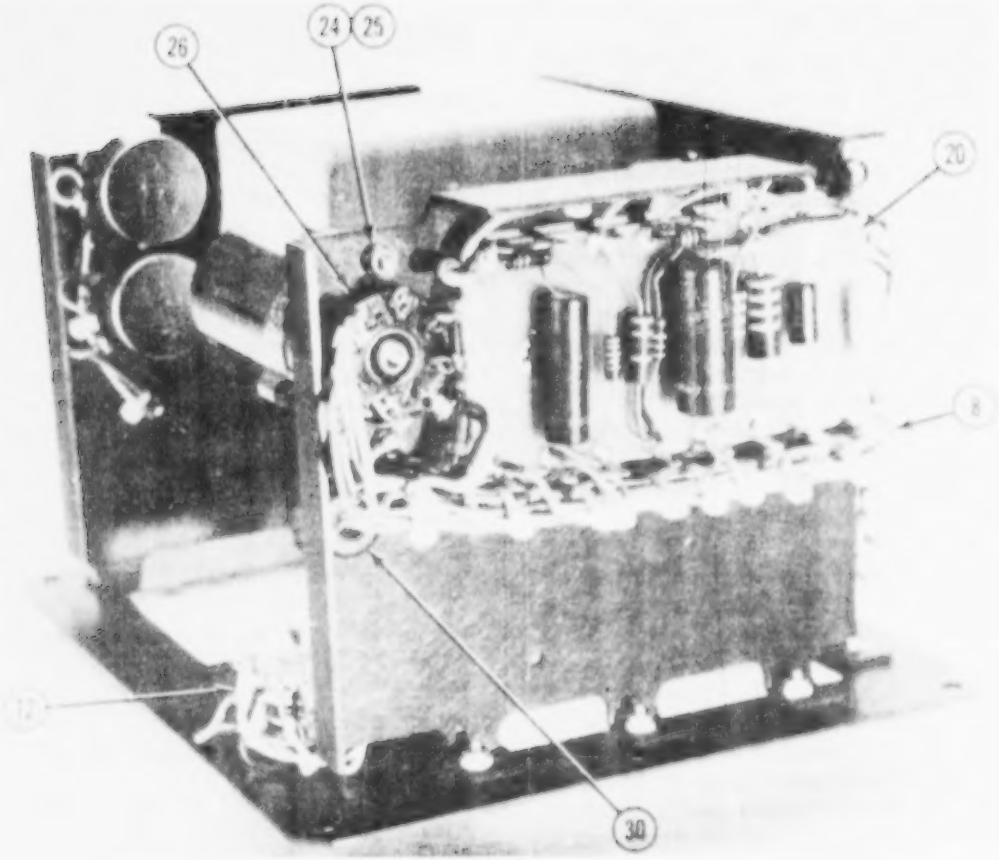
(1) Inspect terminal boards for cracks, separation, and carbonized paths between elements or to chassis, and security of terminals and components.

(2) Inspect for cold solder joints and corrosion at all solder terminals.

(3) Inspect all components for damage and signs of overheating. Inspect components with leads (resistors, etc) for corrosion at point where leads join body.

(4) Inspect tube and relay sockets for broken terminals and other damage. Inspect for carbonized paths between terminals and between terminals and ground. Inspect for loose or missing attaching hardware.

(5) Test tubes, using a suitable tube tester.



Key To Figure 4-9

1. Relay
2. Cover
3. Tube, 6202
4. Tube, OA2
5. Cover
6. Tube, 12BH7
7. Socket
8. Wiring Loom
9. Grommet
10. Transformer
11. Nut
12. Selector Switch
13. Subdeck
14. Rheostat
15. Rheostat
16. Condenser
17. Screw
18. Nut
19. Clamp
20. Terminal Board
21. Terminal Board
22. Terminal Board
23. Socket
24. Screw
25. Nut
26. Socket
27. Socket
28. Screw
29. Nut
30. Grommet
31. Chassis Assembly

Figure 4-9. BH146 Takcal assembly (sheet 2 of 2).

(6) Use a decade resistance bridge or other precision resistance checker to make sure all resistors are within tolerance.

NOTE

Unsolder one lead of resistor under test to isolate from circuit.

(7) Use a suitable capacitor checker to test all capacitors for leakage and capacity.

(8) Inspect cable harness and all wiring for broken wires and condition of insulation.

(9) Inspect all wiring for shrinking of insulation or other signs of overheating.

(10) Inspect electrolytic (polarized) capacitors for leakage of electrolyte.

(11) Use an ohmmeter or suitable continuity checker to test transformer for open windings, continuity between windings, or continuity between windings and case.

e. Repair.

(1) Replace any of the printed circuit boards if any of the following conditions exist:

(a) Separation of plies in board material.

(b) Cracks over 1/8 inch in length, or extending into a terminal mounting.

(c) Carbonized paths between terminals or between terminals and ground.

(d) Loose, separated, or broken terminal lugs.

(2) Separate all components at cold soldered or corroded joints. Clean terminal and conductors of all corrosion and excess solder. Tin all surfaces to be soldered and remake joint.

CAUTION

Provide a heat sink on precision resistor leads between body of resistor and point being soldered or tinned to prevent damage from overheating when soldering.

(3) Replace nicked or scored components or components with broken leads. Replace any component showing signs of overheating and determine cause.

(4) Replace tube or relay sockets if damaged or if carbonized paths are found. Replace or tighten missing or loose attaching hardware.

(5) Replace defective tubes (para. 4-36.)

(6) Replace resistors not within tolerance indicated on body.

(7) Replace any capacitors not within tolerance or showing excessive leakage.

(8) Repair broken wiring in cable harness as follows:

(a) If slack in wire beyond end of cable permits, bare 1/4 inch of wire at break and install in terminal in place of broken end.

(b) If insufficient slack is present, splice a suitable length of same size and color wire at break and cover splice with 3/32- or 1/8-iinch plastic tubing or an approved electrical tape. If same color wire is not available, use white wiring and color code insulation on terminal end with color(s) of original wire.

(c) If wiring break is detected within cable harness and is readily located, repair as in (b) above. Do not splice more than once in any conductor.

(d) If wiring break is detected within cable harness and not readily located, replace wire as outlined in (9) below.

(e) Cover any minor damage to wiring insulation by covering individual wires with 3-32- or 1/8-inch plastic tubing.

(9) Repair wiring having burnt or shrunken insulation as follows:

(a) Trace affected wire to its origin. Unclamp and untie cable harness along entire length of affected wire.

(b) Examine other wires in cable harness for heat damage to insulation.

(c) Replace entire length of all damaged wiring, using same size and color wire. If same color wire is not available, use white wiring and color code insulation on both ends with color(s) of original wire.

(d) Bundle wiring along original path of cable harness and lace in accordance with instructions contained in TM 55-1500-323-25 at 1-inch intervals.

(10) Replace potentiometer if erratic action is noted as adjusting screw is turned.

(11) Replace electrolytic (polarized) capacitors if swollen or signs of electrolyte leakage are noted at seams or terminals.

(12) Replace relay clamp if defective.

(13) Replace transformer if conditions in *d*(11) above exist.

4-28. Potentiometer (%RPM) (Figure 4-8).

a. Removal.

(1) Remove deck assembly (para. 4-32*a*).

(2) Remove rpm check assembly (para. 4-27*a*).

(3) Identify and tag wiring. Unsolder and remove wiring from potentiometer (61).

(4) Remove screws (62) and lockwashers (63) which secure potentiometer to deck. Remove potentiometer.

NOTE

Remove gasket (0 ring) only if damaged.

b. Disassembly and Repair. No disassembly or repair is required. Replace on an as required basis.

4-29. Probe Storage Compartment Assembly (Figure 3-1).

The probe storage compartment assembly provides compact storage facilities for the heater probes. The interior of the probe storage compartment and the probe rack allows storage of hot heater probes without prior cooling. Two trunk-type latches and a stop arm are provided to secure the lid in either the closed or open position.

a. Removal.

(1) Unlatch and raise probe storage compartment (6).

(2) Properly support probe storage compartment (6) and remove screws (30) and stop arm supports (9) from stop arms (8).

CAUTION

Before removing the probe storage compartment (6), insure that it is properly supported to prevent damage to the base assembly (29).

(3) Remove stop arms (8) from tracks.

(4) Remove hinge pin (32) from probe storage compartment hinge and lift probe storage compartment (6) from base assembly (29).

b. Disassembly.

(1) Remove screws (8), stop arm support (6), and spacer (7). Remove stop arm (9) from track in lid (5).

(2) Remove hinge pin (10) and remove lid.

(3) Remove rack (11) by removing attaching screws and washers.

c. Cleaning. Clean all parts of probe storage compartment assembly with dry cleaning solvent (item 1, table 1-1).

d. Inspection and Repair.

(1) Inspect interior and exterior of probe storage compartment (14) and lid (5) for dents, misalignment, condition of paint, and corrosion.

(2) Inspect hinge pin (10) for corrosion, deep scoring, and damage. Replace if defective.

(3) Inspect stop arm (9) for misalignment and excessive wear.

(4) Inspect rack (11) for damage, misalignment, condition of paint, and corrosion.

(5) Dents in lid, probe storage compartment, stop arm, and rack are permissible, providing they do not affect the alignment, rigidity, or utility of the component. Remove dents and restore alignment using an arbor press or other suitable equipment.

(6) Remove corrosion and scratched, peeling, or deteriorated paint with a suitable abrasive such as abrasive paper (item 3, table 1-1). Coat exposed surfaces to be painted with zinc chromate primer (item 4, table 1-1), and allow to dry. Repaint in accordance with TM 9-213. Mask off loops in hinges, threaded holes, and other working surfaces.

(7) Replace stop arm if slide on upper end is damaged or worn so that it will not operate properly.

(8) Replace screw and spacer if thread damage or other condition is evident that would cause improper operation.

(9) Replace hinges, latches, or tracks that are defective or damaged beyond economical repair.

4-30. Handle Assembly.

The handle assembly is constructed of rigid metal tubing and is attached to the tester with a ratchet-type pivot socket at each side to provide positive locking at regular intervals. The handle is locked in the desired position by tightening wing nuts located at the pivot axis.

a. Removal. (Figure 3-1)

(1) Remove wing nuts (25) from bolts (26).

(2) Remove handle assembly from tester by springing handle (31) over bolts (26).

(3) Remove pivot sockets (27) from handle (31).

b. Disassembly. Disassembly is accomplished by removal.

c. Cleaning. Clean all components with dry cleaning solvent (item 1, table 1-1).

d. Inspection and Repair.

(1) Inspect all painted surfaces for general condition.

(2) Inspect handle for misalignment, elongated mounting holes, dents, and scoring.

(3) Inspect pivot socket mating parts for broken or excessively worn teeth.

(4) Inspect attaching hardware for thread damage, elongated mounting holes, and overall condition.

(5) Misalignment of handle can be corrected with a suitable press. Inspect curved portions of handle carefully after alignment is corrected for cracks, kinking, or other signs of weakening. Replace handle if these conditions exist.

(6) Dents and scoring are permissible provided overall rigidity is not affected. Burnish off any burrs or rough spots.

(7) Elongation of all mounting holes is permissible providing longest dimension of elongation does not exceed diameter of bolt by approximately one-third.

(8) Replace complete pivot socket assembly if either part has broken teeth or if wear allows slippage when assembled and wing nuts are hand tight.

(9) Remove any corrosion and scratched, peeling, or deteriorated paint with a suitable abrasive such as abrasive paper, (item 3, table 1-1). Coat exposed surfaces with zinc chromate primer, (item 4, table 1-1), and allow to dry. Repaint in accordance with TM 9-213.

4-31. Base Assembly (Figure 3-1).

The base assembly provides rolling support and a cable storage compartment for the tester. Wheels and a support post on the bottom of the base assembly are provided for ease in transporting the tester to operating locations. The base assembly is sectionalized to provide an upper compartment containing electronic components and a lower compartment used for cable storage. A hinged door is provided in the base assembly for access to the cable storage compartment.

a. Removal.

(1) Remove probe storage compartment.

(2) Remove handle assembly.

(3) Remove voltage regulator (para. 4-16*a*).

(4) Remove cable and printed circuit board assembly, part number BH1766 (para. 4-17*a*).

b. Disassembly.

(1) Unfasten fastener (17) and remove hinge pin (15). Remove door (16). Remove snap ring (18), grommet (19), and fastener (17) from door.

(2) Remove spring (20), locknut (22), and screw (21) from bottom lip of compartment.

(3) Provide several thicknesses of cloth or packing and invert base assembly (31) to gain access to components on bottom.

(4) Remove locknuts (25), screws (24), and support post (23).

(5) Remove retaining rings (27) and slide wheels (26) off axle of wheel mount (28).

(6) Remove locknuts (30), screws (29), and wheel mounts (28).

c. Cleaning. Clean all parts of base assembly with dry cleaning solvent (item 1, table 1-1).

d. Inspection and Repair.

(1) Inspect interior and exterior of base assembly for dents, misalignment, condition of paint, and corrosion.

(2) Inspect hinge pin for corrosion, deep scoring, and damage. Replace if defective.

(3) Inspect all attaching hardware for shearing, stripped threads, and corrosion.

(4) Inspect support posts and wheel mounts for excessive wear, misalignment, scoring, and corrosion.

(5) Inspect wheels for misalignment. Inspect tires for cuts, gouges, and cracks or other signs of deterioration.

(6) Dents in base assembly are permissible providing they do not affect its alignment, rigidity, or utility. Restore alignment and remove dents with an arbor press or other suitable equipment.

(7) Remove corrosion and scratched, peeling, or deteriorated paint with a suitable abrasive such as abrasive paper (item 3, table 1-2). Coat exposed surfaces to be painted with zinc chromate primer (item 4, table 1-2), and allow to dry. Repaint in accordance with TM 9-

213. Mask off loops in hinges, mounting holes, and other working surfaces.

(8) Cuts and gouges in wheels are permissible on wheels if rigidity and utility of wheel is not affected. Cut off any loose ends if rubber shows cracks or other signs of deterioration.

(9) Replace any remaining components with like serviceable items if defective.

4–32. Deck Assembly (Figure 4–6).

The deck assembly (4) provides a mounting base for the tester control knobs, instruments, connectors, and switches. The deck assembly is constructed of machined black plastic or metal painted black with the markings recessed and painted white for legibility. Two stop arm supports are screw-mounted in the deck assembly for attachment of the probe storage compartment stop arms. A power source is connected to the tester. A lamp is provided in both galvanometers (GALVO–1 and GALVO–2) to obtain an accurate reading during test operations. Two fuses are provided in the deck assembly to protect the tester electrical system against electrical overload. Each fuseholder cap incorporates a light fixture to indicate when a fuse has blown.

a. Removal.

(1) Remove probe storage compartment from tester.

(2) Loosen setscrews which secure knob (3) to shaft of voltage regulator (7). Remove knob.

CAUTION

Knob (3) must be removed before attempting to raise the deck assembly.

(3) Remove screws (5) which secure deck assembly (4) to box assembly (18).

CAUTION

The power lead cable must be disconnected at the deck assembly to prevent damage to the tester electrical components.

(4) Raise deck assembly (4) on its edge and disconnect power lead cable at bottom of deck assembly.

CAUTION

Do not set the deck assembly so that electrical components on the bottom will be damaged.

(5) Remove deck assembly (4) from box assembly (18) and place on a suitable test bench.

NOTE

The deck assembly may be removed with the probe storage compartment installed; however, the probe storage compartment must be properly supported until the deck assembly has been installed and the probe compartment stop arms reconnected.

(6) Remove deck gasket (6) from box assembly (18).

NOTE

The deck gasket should be replaced at each removal; however, if a new deck gasket is not available, exercise care to preserve the original deck gasket.

b. Installation.

CAUTION

Carefully inspect interior of box assembly to insure that all foreign matter has been removed.

NOTE

If a new deck gasket is not available, carefully examine the original deck gasket for damage or deterioration. Apply sealing compound (item 5, table 1–1) as necessary to obtain a good seal.

(1) Seat deck gasket (6) in flange of box assembly (18).

(2) Carefully position deck assembly (4) on box assembly (18) and properly support on its side.

(3) Connect power lead cable at bottom of deck assembly (4) and carefully lower deck assembly on flange of box assembly (18).

(4) Secure deck assembly (4) to box assembly (18) with screws (5).

(5) Turn shaft of voltage regulator (7) to its extreme counterclockwise travel.

(6) Carefully position knob (3) on shaft of voltage regulator with pointer aligned on zero and tighten setscrews.

NOTE

Insure that shaft of voltage regulator remains at its extreme counterclockwise travel with pointer of knob (3) aligned on zero while tightening setscrews.

(7) Install probe storage compartment.

4–33. Replacement of Galvanometer (GALVO–1 and GALVO–2) Lamps.

a. Perform steps (1) through (3) of paragraph 4–32*a*.

CAUTION

Knob (3, fig. 4–6) must be removed before attempting to raise deck assembly.

b. Raise deck assembly (4, fig. 4–6) on its edge and properly support.

c. Remove dust cover from bottom of galvanometer (29, fig. 4–8) and/or galvanometer (69).

d. Press in on lamp, rotate 90 degrees counterclockwise, and lift from lampholder.

NOTE

Replace galvanometer lamps with Tungsol TS–55 lamps, or equivalent. If light beam pointer is not bright enough or there is a double image, use another lamp to obtain proper filament focus, or loosen the setscrew that holds the lampholder in place with a 0.050" hex key. Rotate and move the lampholder until a sharp even pointer is obtained. Tighten setscrew and recheck pointer image.

e. Insert replacement lamp in lampholder, press in, and rotate 90 degrees clockwise.

f. Reinstall dust cover on bottom of galvanometer.

g. Carefully lower deck assembly (4, fig. 4–6) on flange of box assembly (18).

NOTE

The deck gasket should be replaced at each removal; however, if a new deck gasket is not available, exercise care to preserve the original deck gasket.

h. Perform steps (4) through (7) of paragraph 4–32*b*.

4–34. Replacement of POWER ON Lamp (Figure 4–8).

a. Unscrew and remove cover from POWER ON light (6, fig. 2–1).

b. Press in on lamp, rotate 90 degrees counterclockwise, and lift from lampholder (76). (Figure 4–8).

c. Insert replacement lamp (77) in lampholder (76), press in, and rotate 90 degrees clockwise.

d. Reinstall cover on POWER ON light (6, fig. 2–1).

4–35. Replacement of Fuses (Figure 4–8).

NOTE

A blown fuse is indicated by a light fixture incorporated in the fuseholder cap.

a. Rotate fuseholder cap counterclockwise until it springs up slightly from fuseholder (73).

b. Lift fuseholder cap from fuseholder.

c. Remove fuse (74 and 75) from fuseholder cap.

d. Insert replacement fuse firmly in fuseholder cap.

e. Position fuseholder cap on fuseholder.

f. Press fuseholder cap in slightly and rotate clockwise to tighten.

4–36. Replacement of RPM Check Assembly Tubes (Takcal Unit.)

The RPM check assembly is provided with a 12BH7, nine-pin base, twin-triode tube; an OA2, seven-pin base, gas-filled voltage regulator tube; and a 6202, seven-pin base, full wave rectifier tube. The 12BH7 tube (6, fig. 4–9) is used as a resistance coupled amplifier. The OA2 tube (4, fig. 4–9) is used to maintain power used by the 12BH7 tube circuit at 150 volts. The 6202 tube (3, fig. 4–9) is used to transform ac power to dc power.

a. Perform steps (1) through (3) of paragraph 4–32*a*.

CAUTION

Knob (3, fig. 4–6) must be removed before attempting to raise deck assembly.

b. Raise deck assembly (4, fig. 4–6) on its edge and properly support.

c. Remove tube shield and defective tube from RPM check assembly.

CAUTION

Use only ruggedized tubes for replacement.

d. Install proper replacement tube and tube shield in RPM check assembly.

e. Carefully lower deck assembly (4) on flange box assembly (18).

NOTE

The deck gasket should be replaced at each removal; however, if a new deck gasket is not available, exercise care to preserve the original deck gasket.

Section IV. REASSEMBLY AND ALIGNMENT

4–37. General.

This section contains instructions for authorized reassembly and/or installation and adjustment procedures for the potentiometer, resistance check, insulation check, and RPM check circuits of the tester.

NOTE

No adjustment procedures for the egt indicator check circuit are necessary. The circuit will be properly adjusted if the potentiometer circuit is in adjustment. Refer to Table 4–1 for egt indicator check circuit troubleshooting.

4–38. Voltage Regulator (Figure 4–6).

a. Reassembly. No reassembly of voltage regulator is required.

b. Installation.

(1) Install voltage regulator (7) on box assembly (18) and secure with lockwashers (9) and bolts (8).

(2) Using figure 4–15 as a guide, connect wiring to rear of voltage regulator (7). (Figure 4–6).

(3) Install deck assembly (para. 4–32*c*).

c. Alignment. The only alignment necessary is that the knob pointer be at 0 when the voltage regulator is against its counterclockwise stop.

4–39. BH1766 Printed Circuit Board Assembly and Cable (Figure 4–6).

a. Reassembly.

(1) Connect and solder all component leads removed in paragraph 4–17*b*(3).

(2) Plug transformer (11, fig. 4–7) into socket on printed circuit board (24) and align mounting studs with mating holes in printed circuit board. Carefully work studs through holes until printed circuit board is flush with transformer housing. Install nuts.

(3) Install rectifiers (2) and fuse (13) in fuse and rectifier holders.

NOTE

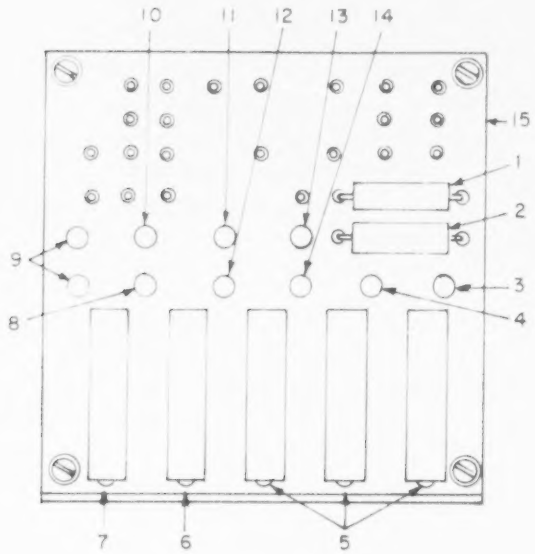
Observe polarity when installing rectifiers. Arrowhead of diode symbol on rectifier should point toward positive (+) terminal. Rectifier holders are **polarized.**

b. Installation. (Figure 4–6).

(1) Connect wiring to voltage regulator (7).

(2) Install cable and printed circuit board assembly (16) on box assembly (18) and secure with screws (17).

(3) Install deck assembly (para. 4–32*b*).



Key to Figure 4–10

1. Resistor
2. Resistor
3. Resistor
4. Resistor
5. Potentiometer
6. Potentiometer
7. Potentiometer
8. Resistor
9. Resistor
10. Resistor
11. Resistor
12. Resistor
13. Resistor
14. Resistor
15. Printed Circuit Board

Figure 4–10. BH1760 printed circuit board assembly.

4–40. BH1760 Printed Circuit Board Assembly (Figure 4–10).

a. Reassembly. No reassembly of the printed circuit board assembly is required.

b. Installation.

(1) Position printed circuit board assembly (49, fig. 4–8) on deck (128) and secure with spacers (53) and screws (50).

(2) Solder wiring in bundle to corresponding terminals on printed circuit board assembly.

(3) Install deck assembly (para. 4–32*b*).

c. Deleted.

Figure 4–11. Deleted.

4–41. Galvanometers (GALVO–1 and GALVO–2) (Figure 4–8).

a. Reassembly. No reassembly is required except step *b*(2) below.

b. Installation.

CAUTION

Failure to provide cover for the deck may result in damage from melted solder or hot soldering iron.

(1) Feed wiring through openings in dust cover and connect to proper terminals in galvanometers (29) and 69). Provide several thicknesses of cloth or other suitable cover for top of deck (128).

All data on page 4–33 deleted.

(2) Solder wiring to terminals in galvanometer. Install dust cover and screw at rear of galvanometer.

(3) Install galvanometer through opening in deck, taking care not to damage wiring or nearby components.

(4) Install screws which secure galvanometer in deck.

4–42. Potentiometer (°C) (Figure 4–12).

a. Reassembly. No reassembly is required.

b. Installation.

NOTE

If removed, install new gasket (O ring) on potentiometer.

(1) Install potentiometer (19, fig. 4–8) in deck (128). Install screws which secure potentiometer in deck.

(2) Connect and solder wiring to proper terminals on potentiometer.

(3) Install knob on potentiometer and tighten setscrew.

(4) Install voltage regulator and BH-1766 printed circuit board assembly (para. 4–38*b* and 4–39*b*).

(5) Install deck assembly (para. 4–32*b*).

4–43. Insulation Check Meter (Figure 4–8).

a. Reassembly. No reassembly is required.

b. Installation.

CAUTION

Failure to provide cover for top of deck may result in damage from melted solder or hot soldering iron.

(1) Connect and solder wiring to proper terminals of meter (39). Provide several thicknesses of cloth or other suitable cover for top of deck (128).

(2) Install meter through opening in deck, taking care not to damage wiring or nearby components.

(3) Install screws which secure meter in deck.

4–44. Potentiometer (R–1) (Figure 4–8).

a. Reassembly. No reassembly is required.

b. Installation.

(1) Install shaft of potentiometer (13) through opening in deck (128). Install grommet and nut which secure potentiometer in deck.

(2) Install knob (12) on potentiometer and tighten setscrew.

(3) Connect and solder wiring to proper terminals of potentiometer.

(4) Install deck assembly (para. 4–32*b*).

4–45. Rotary Switches (Figure 4–8).

a. Reassembly. No reassembly is required.

b. Installation.

(1) Install shaft of rotary switches (10, 16, 34, and 37) through opening in deck (128). Install seal nut which secures rotary switch in deck.

(2) Install knobs on rotary switches and tighten setscrews.

(3) Connect wiring to proper terminals of selector switches and secure with screws or solder.

(4) Install deck assembly (para. 4–32*b*).

4–46. Toggle Switch (Figure 4–8).

a. Reassembly. No reassembly is required.

b. Installation.

NOTE

If removed, install new grommet over switch handle of toggle switch.

(1) Install toggle switch (98) through opening in deck (128). Secure toggle switch in deck with knurled retaining cap.

(2) Connect and solder wiring to proper terminals on toggle switch. Tin chromel-alumel wire as follows if required:

(a) Carefully clean all dust, grease, and insulation from section to be joined.

(b) Silver solder stripped section, using silver solder, (item 6, table 1–2), and rosin flux, (item 7, table 1–1).

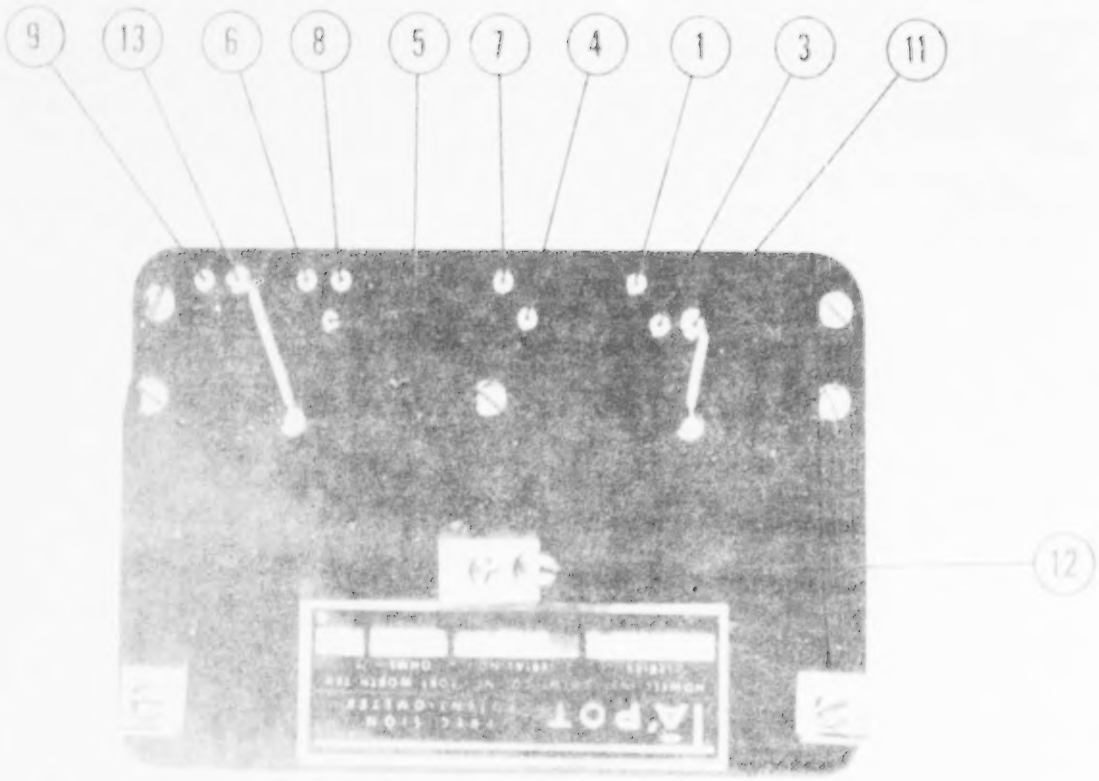


Figure 4–12. Terminal locations, potentiometer °C.

(c) Break off hard flux formed
er silver solder.

(d) Make connection using
in core solder, (item 8, table 1–2).

(3) Install deck assembly (para. 4–
).

47. Connectors (Figure 4–8).

a. Reassembly. No reassembly is required.

b. Installation.

NOTE

Install new gasket if removed.

(1) Install connector (78) through opening in deck (128). Align mount (9) on deck and secure with screws and lockwashers.

(2) Connect and solder wiring to proper terminals on connector.

(3) Install connectors (88, 100, and 110) as outlined in (1) and (2) above.

NOTE

On connectors (88 and 100), tin chromel-alumel leads, if required.

(4) Install deck assembly (para. 4–32*b*).

4–48. RPM check assembly.

a. Reassembly.

(1) Install relay (1, fig. 4–9) in socket and engage clamp (19).

(2) Install tubes and tube shields (para. 4–36).

(3) Install all other parts removed in paragraph 4–27*b*.

b. Installation.

(1) Position RPM check assembly (54, fig. 4–8) on deck (128) and secure with screws (57) and lockwashers (59).

(2) Install seal nut on selector switch (12, fig. 4–9). Install knobs on selector switch and potentiometer (61, fig. 4–8) and tighten setscrews.

(3) Connect and solder wiring to proper terminals of RPM check assembly (54).

(4) Install galvanometer (69) (para. 4–41*b*).

(5) Install deck assembly (para. 4–32*b*).

c. Deleted.

4–49. Potentiometer (%RPM) (Figure 4–8).

a. Reassembly. No reassembly is required.

b. Installation.

(1) Position potentiometer (61) in RPM check assembly (54) and secure with screws and lockwashers.

(2) Connect and solder wiring to proper terminals of potentiometer.

(3) Install RPM check assembly.

(4) Install deck assembly (para. 4–32*b*).

4–50. Probe Storage Compartment Assembly (Figure 3–1).

a. Reassembly.

(1) Install rack (11) and secure with screws and washers.

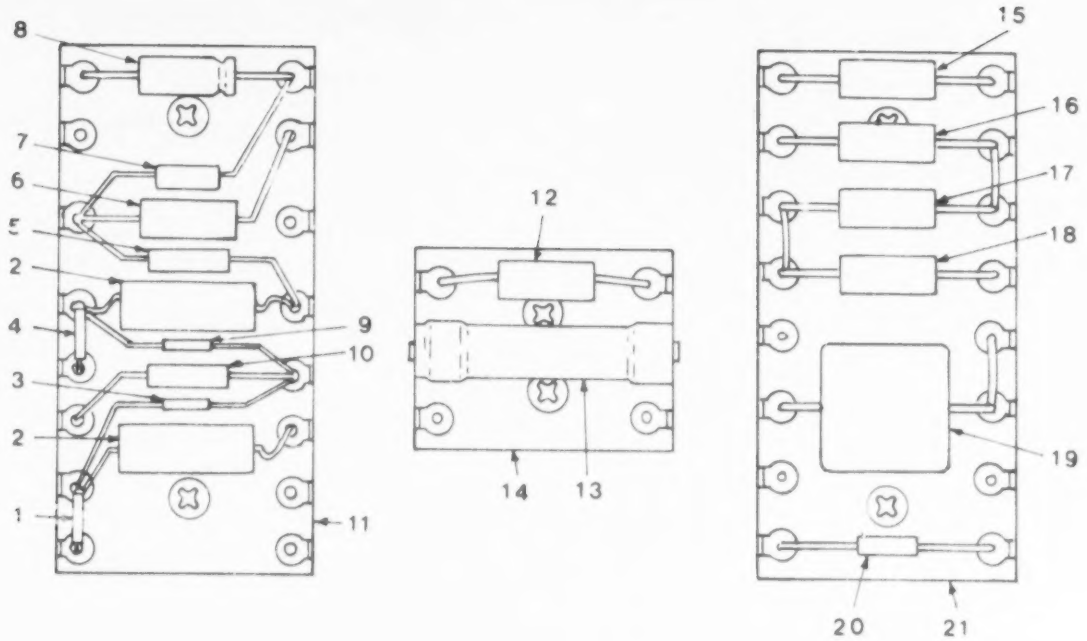
(2) Install lid (5) on probe storage compartment (14) and properly align mating hinge halves. Install hinge pin (10).

CAUTION

Do not drop or rest lid in full open position. Possible damage to hinges or misalignment may result.

(3) Raise lid and install stop arm (9) in track in lid. Align lower end of stop arm with mounting flange in bottom of probe storage compartment and secure with screw (8), stop arm support (6) and spacer (7).

b. Installation. Install probe storage compartment.



Key to Figure 4-13

1. Resistor	8. Condenser	15. Resistor
2. Capacitor	9. Resistor	16. Resistor
3. Resistor	10. Resistor	17. Resistor
4. Resistor	11. Terminal Board	18. Resistor
5. Condenser	12. Resistor	19. Capacitor
6. Resistor	13. Resistor	20. Resistor
7. Resistor	14. Terminal Board	21. Terminal Board

Figure 4-13. Terminal board assemblies.

4-51. Handle Assembly.

a. Reassembly. Reassembly is accomplished by installation.

b. Installation. Install handle assembly (para. 3-3*a*).

4-52. Base Assembly (Figure 3-1).

a. Reassembly.

(1) Install wheel mounts (28) and secure with screws (29) and locknuts (30).

(2) Install wheels (26) on axle of wheel mounts (28) and secure with retaining rings (27).

(3) Install support post (23) and secure with screws (24) and locknuts (25).

(4) Set base assembly (31) in an upright position.

(5) Install spring (20), screw (21), and locknut (22) in proper position on bottom lip of compartment.

(6) Install fastener (17), grommet (19), and snap ring (18) on door (16). Align hinge half on door properly with hinge half on base assembly (31) and install hinge pin (15).

b. Installation.

(1) Install cable and printed circuit board assembly, part No. BH1766 (para. 4-38*b*).

(2) Install voltage regulator (para. 4-39*b*).

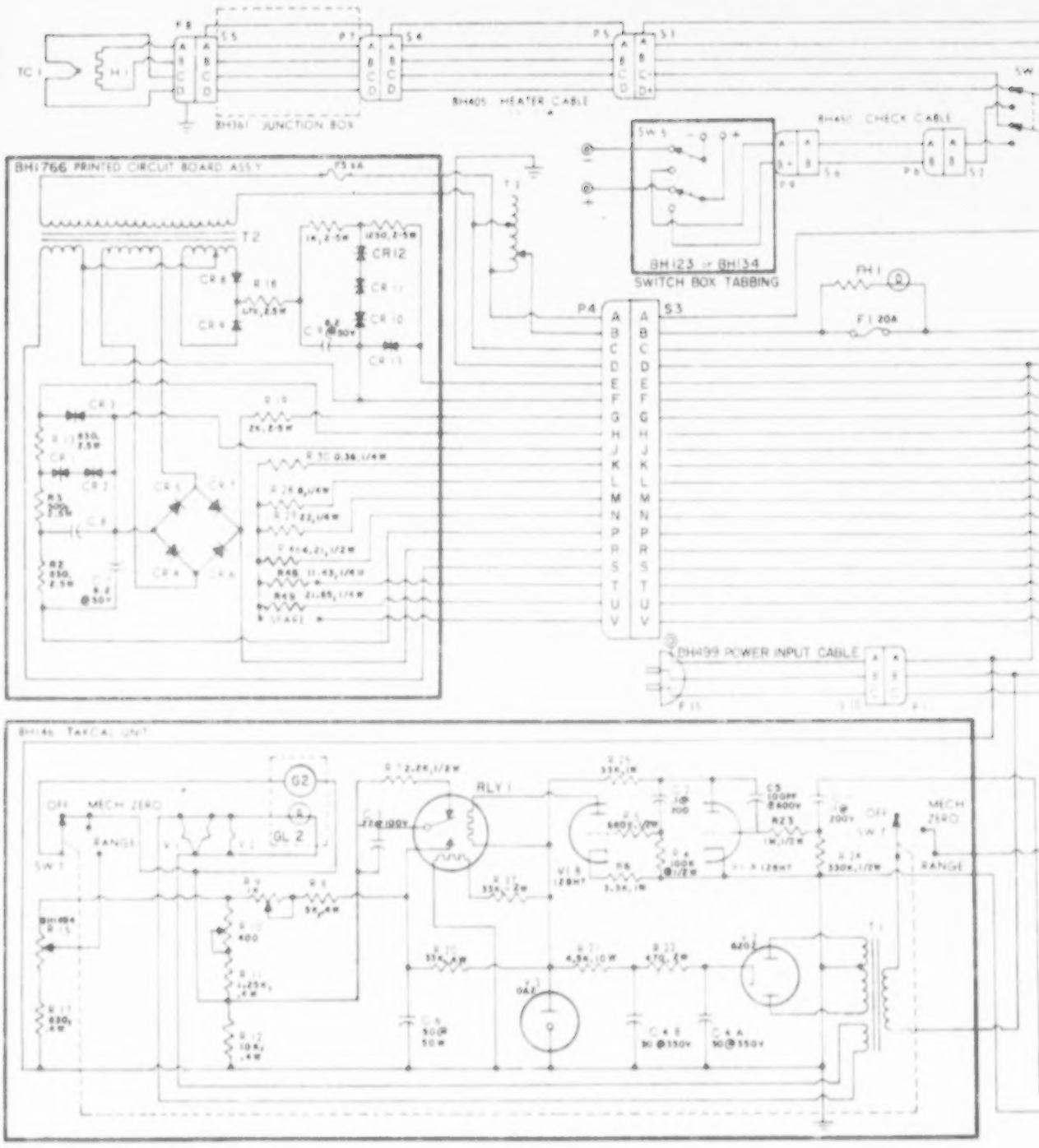
(3) Install handle assembly (para. 3-3*a*).

(4) Install probe storage compartment (para. 3-18*d*).

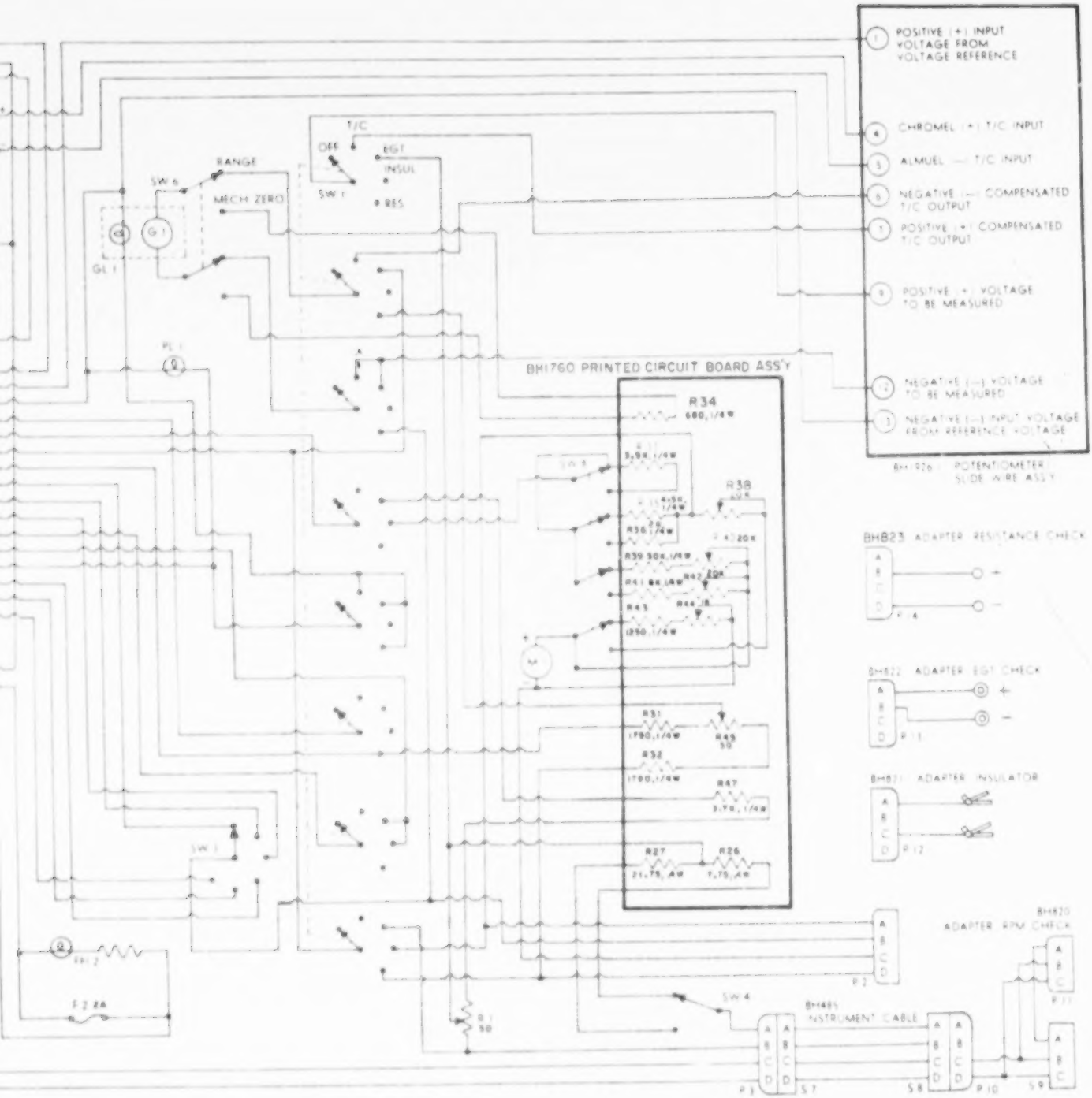
Figure 4–14. **Deleted**

Section V. ALPHA-NUMERIC PARTS LIST AND PROBE REFERENCE TABLE

This Section contains Table 4–2, Alphanumeric Parts List and Table 4–3, Probe Reference Table.


BH1766 PRINTED CIRCUIT BOARD ASSY
BH361 JUNCTION BOX
BH405 HEATER CABLE
BH445 CHECK CABLE
BH123 or BH134
SWITCH BOX TABBING
BH499 POWER INPUT CABLE
F1 20A
RLY1
MECH ZERO
RANGE

Figu



NOTES:

1. ALL RESISTANCES ARE IN OHMS.
2. ALL CAPACITANCES ARE IN MICROFARADS UNLESS OTHERWISE NOTED.

e 4–15. Schematic diagram.

Table 4–2. Alpha-numeric Parts List.

Reference no.	Mfg code	Fig. no.	Item no.
ANCH4A	88044	3–6	8
AN253–2–1187	88044	4–10	15
AN253–2–1812	88044	4–10	10
AN3027–3	88044	4–8	98
AN500C6–8	88044	4–8	50
AN6227–10	88044	4–8	123
AN6227–5	88044	4–8	27
		4–8	68
AN931–4–7	88044	4–9	30
BH112JA–36		1–1	
BH1185		4–7	19
BH1194		4–8	44
BH123–3		B–1	5
BH1401		4–9	10
BH1428		4–14	19
BH1430		4–8	15
		4–8	33
		4–8	36
		4–8	55
BH1431		4–14	18
BH1433		4–14	7
BH1443		4–14	23
BH1444		4–14	15
BH1445		4–14	
BH1446		4–14	
BH1452		4–14	11
BH1455			
BH146		4–8	54
BH1468		4–9	21
BH1475		4–9	22
BH1476		4–14	20
BH1477		4–14	17
BH1479		4–9	20
BH1480–1		4–9	8
BH1480–2		4–9	9
BH1481		4–9	13
BH1484		4–9	31
BH1486		4–9	12
BH1494		4–8	61
BH1498		4–9	1
BH1504			
BH15158		4–8	23
		4–8	65
BH15159		4–8	120
BH15161		4–8	128
BH15164		4–8	22
		4–8	64
BH1569		4–7	6
BH1570		4–7	9
BH1571		4–7	5

Table 4–2. Alpha-numeric Parts List—Continued.

Reference no.	Mfg code	Fig. no.	Item no.
BH15913		4–7	12
BH165			
BH165–1			
BH1720			
BH1721		3–2	5
BH1722		4–12	1
BH1724		4–8	13
BH1726		4–10	
BH1726–2		4–10	
BH1727		4–10	31
BH1727–1		4–10	31
BH1732		4–10	14
BH1740			
BH1740–1			
BH1744		4–8	128
BH1751		4–8	34
BH1752		4–8	10
BH1753		4–8	37
BH1760		4–8	49
BH1760–1			
BH1761		4–11	15
BH1765		4–8	1
BH1766		3–6	16
BH1768		4–7	24
BH1768		4–7	1
BH1770		4–11	3
BH1771		4–11	4
BH1772		4–11	14
BH1773		4–11	12
BH1774		4–11	8
BH1775		4–11	9
BH1776		4–11	10
BH1777		4–11	11
BH1778		4–11	13
BH1780		4–7	8
BH1781		4–7	14
BH1782		4–7	15
BH1785		4–7	11
BH1795		4–10	11
BH1926–1		4–8	19
BH274		4–11	2
BH275		4–11	1
BH277			
BH3506		4–10	26
BH361–5		B–1	11
BH3670		4–7	3
BH3717		4–7	2
BH405		B–1	1
BH437		4–10	6
BH450		B–1	2

Table 4–2. Alpha-numeric Parts List—Continued.

Reference no.	Mfg code	Fig. no.	Item no.
BH4548		B–1	6
BH485		B–1	4
BH492B–3		B–1	12
BH499		B–1	3
BH5033		4–7	21
BH574		4–8	127
BH580		4–8	32
		4–8	72
BH581		4–8	43
BH625–4		4–8	53
BH659		4–10	5
BH723		4–10	7
BH727		4–10	4
BH755		4–7	20
BH769		4–10	1
BH796		4–10	9
BH799		4–8	124
BH804		4–7	17
BH805		4–7	18
BH806		4–7	16
BH815		4–8	16
BH819A		4–8	39
BH820		B–1	10
BH821		B–1	7
BH822		B–1	9
BH823		B–1	8
BH824			
BH824–1			
BH834		4–10	23
BH835		4–10	28
BH838		4–10	16
BH9041S		4–8	45
BH9044P		4–8	110
BH9046S		4–8	100
BH9047S		4–8	88
BH9048P		4–8	78
BH937–1		4–8	111
BH937–2		4–8	89
		4–8	101
BH937–3		4–8	79
BH950A		4–8	69
BH951		4–8	29
BH996–40		3–2	2
BJR4–40–118°x388	72794	4–10	17
Bolt, 5 /16–24x2–1/4 in. long, stainless steel		4–10	3
CL65BH400MP3	81349	4–14	8
CL65CK8R2MP3	81349	4–7	7
DD–101	71590	4–9	7
FP210A	37942	4–9	16

Table 4–2. Alpha-numeric Parts List—Continued.

Reference no.	Mfg code	Fig. no.	Item no.
GH4	72794	4–10	19
H–1022	02799	4–14	21
HKLW	71400	4–8	73
MBO–2	71400	4–8	74
MBO–20	71400	4–8	75
MDL–1	71400	4–7	13
MPY2P1	09023	4–14	2
MS20365–440A	96906	4–8	26
		4–8	31
		4–8	58
		4–8	71
		4–8	67
		4–8	84
		4–8	94
		4–8	106
		4–8	116
		4–8	122
		4–9	18
		4–9	29
MS20365–632A	96906	4–10	22
		4–8	42
		4–8	52
		4–9	11
MS20365–832A	96906	4–9	25
MS20365–1032A	96906	4–7	22
MS20365–1032A	96906	4–10	13
		4–10	25
MS21318–1	96906	4–10	30
MS24630–1	96906		
MS25043–12C	96906		
MS25043–14C	96906	4–8	117
		4–8	95
MS25043–16C	96906	4–8	107
MS35190–239	96906	4–8	85
MS35201–53	96906	4–8	
MS35201–56	96906	4–8	126
MS35333–70	96906	4–8	125
MS35333–71	96906	4–8	21
		3–6	12
		3–6	15
		4–8	4
		4–8	7
		4–8	41
		4–8	48
		4–8	51
		4–8	59
		4–8	63
		4–8	81
		4–8	91
		4–8	103
		4–8	113

Table 4–2. Alpha-numeric Parts List—Continued.

Reference no.	Mfg code	Fig. no.	Item no.
MS35338–139	96906	3–6	9
MS51957–12	96906	4–8	86
		4–8	96
		4–8	108
		4–8	118
MS51957–13	96906	4–8	20
		4–9	17
		4–9	28
MS51957–17	96906	4–8	30
MS51957–26	96906	4–8	47
		4–8	57
		4–8	62
		4–8	80
		4–8	90
		4–8	102
		4–8	112
MS51957–27	96906	3–6	11
		3–6	14
		4–8	3
		4–8	6
		4–9	24
MS51957–31	96906	4–8	40
MS51957–46	96906	3–6	17
MS51957–64	96906	4–10	12
		4–10	24
MS51957–65	96906	4–10	29
MS51958–62	96906	4–10	
MS51958–63	96906	4–10	8
MS51959–15	96906	4–10	21
MS51959–28	96906		
N–1030–B	97539	4–8	11
		4–8	99
N–9030x1/4	97539	4–8	14
		4–8	35
		4–8	38
		4–8	56
OA2	86684	4–9	4
PC–9	00629	4–7	23
RC20GF104K	81349	4–14	9
RC20GF105K	81349	4–14	1
RC20GF222K	81349	4–14	22
RC20GF334K	81349	4–14	3
RC20GF684K	81349	4–14	4
RC32GF331K	81349	4–14	10
RC32GF333K	81349	4–14	5
RC42GF333K	81349	4–14	6
RC42GF471K	81349	4–14	13
SEAL SCREW, 4–40x3/8, pan head, cross recessed	13861	4–8	30
		4–8	70
SEAL SCREW, 4–40x7/16, pan head, cross recessed	13861	4–8	25
		4–8	57

Table 4-2. Alpha-numeric Parts List—Continued.

Reference no.	Mfg code	Fig. no.	Item no.
SEAL SCREW, 4-40x1/2, pan head, cross recessed	13861	4-8	66
		4-8	82
		4-8	92
		4-8	104
		4-8	114
SEAL SCREW, 4-40x9/16, pan head, cross recessed	13861	4-8	121
		4-8	24
		4-8	83
		4-8	93
		4-8	105
SEAL SCREW, 6-32x3/8, pan head, cross recessed	13861	4-8	115
		4-8	20
SEAL SCREW, 6-32x1/2, pan head, cross recessed	13861	4-8	62
		4-8	40
SEAL SCREW, 6-32x3/4, pan head, cross recessed	13861	4-8	50
S4-225	72794		
VPR10F	71482	4-10	20
W-20	24655	4-14	14
WIN NUT, 5/16-24, stainless steel		3-6	7
1N429	04713	4-10	2
1N5059	03508	4-7	4
062-0375MDK	00287	4-7	10
10 36675 12	77820	4-8	9
10 36675 14	77820	4-8	119
		4-8	97
10 36675 16	77820	4-8	109
12BH7	86684	4-8	87
1475	72512	4-9	6
		4-8	12
		4-8	18
1500	72512	4-8	60
22B2	07387	4-8	8
301-00-1KΩ	80294	4-9	19
301-00-20KΩ	80294	4-11	6
301-00-50Ω	80294	4-11	5
328	71744	4-11	7
4	72794	4-8	77
43C2-1000Ω	12697	4-10	18
43C2-400Ω	12697	4-9	15
5 16-6	95987	4-9	14
		3-6	13
5100-62	79136	4-8	2
56A	71785	4-10	27
6202	86684	4-8	46
7/16-6	95987	4-9	3
		3-6	10
77-MIP-8	02660	4-8	5
855-SI-R-2-STD	08717	4-9	26
9702	00629	4-8	76
		4-9	2

Table 4-2. Alpha-numeric Parts List—Continued.

Reference no.	Mfg code	Fig. no.	Item no.
9710	00629	4-9	5
9718	00629	4-9	23
9736	00629	4-9	27

Table 4-8. Probe Reference Table.

Engine	Aircraft	Probe P/N	Qty	Check Cable Adapter	RPM Adapter
T53-L-1A	UH-1A	BH996-40	3	BH1504	BH820
T53-L-9A	UH-1B, UH-1D	BH996-40	3	BH1504	BH820
T53-L-11B, C, D	UH-1B	BH996-40	3	BH1504	BH820
T53-L-11B, C, D	UH-1C	BH996-40	3	BH1504	BH820
T53-L-11B, C, D	UH-1D	BH996-40	3	BH1504	BH820
*T53-L-13A, B	UH-1H	BH7434L-40	3	BH4352	BH820
		BH7434R-40	3		
*T53-L-13A, B	UH-1M	BH7434L-40	3	BH4352	BH820
		BH7434R-40	3		
*T53-L-13A, B	AH-1G, TH-1G	BH7434R40	3	BH1504	BH820
		BH7434L40	3		
T53-L-7, 7A	OV-1A, -1B, -1C	BH996-40	3	BH1504	BH820
*T53-L-15	OV-1C	BH7434R-40	3	BH8009	BH820
		BH7434L-40	3		
*T53-L-701	OV-1D	BH7434R-40	3	BH8009	BH820
		BH7434L-40	3		
*T63-A-5A	OH-6A	BH7413-40	4	BH7424	BH820
*T63-A-700	OH-58A	BH7413-40	4	BH7424	BH820
T55-L-5	CH-47A	BH996-40	3	BH4548	BH820
T55-L-7	CH-47A	BH996-40	4	BH4548	BH820
T55-L-7, B, C	CH-47B, C	BH996-40	4	BH4548	BH820
*T55-L-11	CH-47C	BH7415-40	5	BH10456	BH820
**T55-L-11A	CH-47C	BH7454AA-40	5		BH820
		BH7454BB-40	5		
***T73-P-1	CH-54A	BH7448-40	3	BH2913	BH820
T73-P-700	CH-54B	BH7448-40	6	BH2913	BH820

Table 4–3. Probe Reference Table—Continued.

Aircraft	Engine	Probe P/N	Qty	Check Cable Adapter	RPM Adapter

**Bench test only.
***T/C must be removed from engine to test.
*Probe and check cable adapter not issued with BH112JA36 tester

APPENDIX A

REFERENCES

A-1. Dictionaries of Terms and Abbrevations.

AR 310-25	Dictionary of United States Army Terms
AR 310-50	Authorized Abbreviations and Brevity Codes
H 4-1 and H 4-2	Federal Supply Code for Manufacturers
MIL-STD-12C	Abbreviations for Use on Drawings, Specifications, Standards and in Technical Documents

A-2. Publication Indexes

DA PAM 310-1	Index of Adminiatration Publications
DA PAM 310-2	Index of Blank Forms
DA PAM 310-4	Index of Technical Manuals, Technical Bulletins, SUpply Manuals (types 7, 8, and 9), Supply Bulletins, and Lubrication Orders

A-3. Logistics and Storage

TM 740-90-1	Administrative Storage of Equipment
TM 743-200-1	Storage and Materials Handling

A-4. Maintenance of Supplies and Equipment

AR 750-1	Army Material Maintenance Concepts and Policies
TM 38-750	The Army Maintenance Management System (TAMMS)
TM 43-0139	Painting Operations Instructions for Field Use

A-5. Other Publications

AR 420-90	Fire Prevention and Protection
AR 55-38	Reporting of Transportation Discrepancies in Snipments
AR 700-58	Packaging Improvement Report
DA PAM 310-13	Military Publications Posting and Filing
FM-21-11	First Aid for Soldiers
TB 43-180	Calibration Requirements for the Maintenance of Army Materiel
TM 750-244-1-4	Procedures for the Destruction of Aviation Ground Support Equipment (FSC 4920) to Prevent Enemy Use
TM 55-1500-204-25/1	General Aircraft maintenance Manual
TM 55-1500-323-25	Organizational Direct Support and General Support and Depot Maintenance Manual Installation Practices for Aircraft Electric and Electric Wiring

APPENDIX B

MAINTENANCE ALLOCATION CHART

B–1. General.

The purpose of the Maintenance Allocation Chart is to assign maintenance functions and repair operations to be performed by the lowest appropriate maintenance echelon.

B–2. Maintenance Functions.

Maintenance functions shall be limited to and defined as follows:

a. Adjust. Maintain within prescribed limits by bringing into proper or exact position, or by setting the operating characteristics to the specified parameters.

b. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

c. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

d. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

e. Install. The act of emplacing, seating, or fixing into position an item, part, module (component or assembly) in a manner to allow the proper functioning of the equipment/system.

f. Overhaul. That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (e.g., DMWR) in pertinent technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

g. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like-new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours, miles, etc.) considered in classifying Army equipment/components.

h. Repair. The application of maintenance services (inspect, test, service, adjust, align, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module/component/assembly, end item or system.

i. Replace. The act of substituting a serviceable like-type part, subassembly, module (component or assembly) in a manner to allow the proper functioning of an equipment/system.

j. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean, preserve, drain, paint, or to replenish fuel/lubricants/hydraulic fluids or compressed air supplies.

k. Test. To verify serviceability and to detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

l. Symbols. The uppercase letter placed in the appropriate column indicates the lowest level at which that particular maintenance function is to be performed.

best copy available

B-3. Explanation of Format.

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to match components, assemblies, sub-assemblies, and modules with the next higher assembly.

b. Column 2, Functional Group. Column 2 lists the next higher assembly group and the item names of components, assemblies, subassemblies and modules within the group for which maintenance is authorized.

c. Column 3, Maintenance Function. Column 3 lists the twelve maintenance functions defined in B-2 above. Each maintenance function required for an item shall be specified by the symbol among those listed in *d* below which indicates the level responsible for the required maintenance. Under this symbol there shall be listed an appropriate work measurement time value determined as indicated in *e* below.

d. Use of Symbols. The following symbols shall be used to prescribe work function responsibility:

O—Organization
F—Direct Support
H—General Support
D—Depot

e. Work Measurement Time. The active repair time required to perform the maintenance function.

f. Column 4, Tools and Equipment. This column used to specify, by code, those tools and test equipment required to preform the designated function.

g. Column 5, Remarks. Self-explanatory.

MAINTENANCE ALLOCATION CHART
for
Tester, Exhaust Gas Temperature, Part Number BH112JA-36,
FSN 4920-673-5514

(1)	(2)	(3) MAINTENANCE FUNCTION										(4)	(5)
Group No	FUNCTIONAL GROUP	INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD	TOOLS AND EQUIPMENT	REMARKS
4008	Tester, Exhaust Gas Temperature	O	F	F	F		*		O	H				
0801	Box Assembly	O		O						F				
	Handle Assembly	O		O						F				
	Wheel Assembly	O		O						F				
0802	Deck Assembly	O		O					O	F				
	Power On Lamp	O		O										
	Galvo Lamps	O		O										
0803	Insulation Check Meter	O	F		F				F	H				
0804	Switches and Circuit Breakers	O							F					
0805	Cables and Connectors	O	F						F	F				
0806	Voltage Regulator	O	F						F	F				
0807	Vacuum Tubes	O	F						F					
0808	Circuit Board	F	F						F	H				
	Potentiometer	F	F						F	H				
	RPM Check Assembly	F	F						O	H				
	Galvanometers	F	F						F	H				

* TB 750-236

APPENDIX C

REPAIR PARTS AND SPECIAL TOOLS LIST

(Current as of 17 October 1973)

Section I. INTRODUCTION

C–1. Scope.

This appendix lists the repair parts required for the performance of direct support and general support maintenance of the Tester, Exhaust Gas Temperature, P/N BH112JA36.

C–2. General.

This Repair Parts and Special Tools List is divided into the following sections:

a. Section II. Repair Parts List. A list of repair parts authorized for use in the performance of maintenance. Parts lists are composed of assemblies in ascending figure number sequence with the parts in each assembly listed in item number sequence.

b. Section III. Special Tools List. (Not Applicable)

c. Section IV. Federal Stock Number and Reference Number Index. A list, in ascending numerical sequence, of all Federal stock numbers appearing in the listings, followed by a list, in alpha-numeric sequence, of all reference numbers appearing in the listings. Federal stock numbers and reference numbers are cross-referenced to each illustration figure and item number appearance.

C–3. Explanation of Columns.

The following provides an explanation of columns found in the tabular listings:

a. Source, Maintenance, and Recoverability Codes (SMR).

(1) Source Code. Source codes are assigned to support items to indicate the manner of acquiring support items for maintenance, repair, or overhaul of end items. Source codes are entered in the first and second positions of the Uniform SMR code format as follows:

Code	Definition
PA	Item procured and stocked for anticipated or known usage.
PB	Item procured and stocked for insurance purpose because essentiality dictates that a minimum quantity be available in the supply systems.
XB	Item is not procured or stocked. If not available through salvage, requisition.

NOTE

Cannibalization or salvage may be used as a source of supply for any items source coded above except aircraft support items as restricted by AR 700–42.

(2) *Maintenance Code.* Maintenance codes are assigned to indicate the levels of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the Uniform SMR Code format as follows:

(a) The maintenance code entered in the third position will indicate the lowest maintenance level authorized to remove, replace, and use the support item. The maintenance code entered in the third position will indicate one of the following levels of maintenance.

Code	Application/Explanation
F	Support item is removed, replaced, used at the direct support level.
H	Support item is removed, replaced, used at the general support level.

(b) The maintenance code entered in the fourth position indicates whether the item is to be repaired and identifies the lowest maintenance level with the capacity to perform complete repair (i.e., all authorized maintenance functions). This position will contain the following maintenance code:

Code	Application/Explanation
Z	Nonreparable. No repair is authorized.

(3) *Recoverability Code.* Recoverability codes are assigned to support items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the Uniform SMR Code format as follows:

Code	Definition
Z	Nonreparable item. When unserviceable, condemn and dispose at the level indicated in position 3.

b. Federal Stock Number. Indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. Description. Indicates the Federal item name and, if required a minimum description to identify the item. The description column includes the following subcolumns:

(1) *Reference Number and Manufacturer Code.* Indicates the primary number used by the manufacturer (individual, company, firm corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specification standards and inspection requirements, to identify an item or range of items. The primary number is followed by the Federal supply code for manufacture (FSCM) in parentheses. The FSCM is a 5-digit numeric code listed in SB 708-42 which is used to identify the manufacturer, distributor, or Government agency, etc.

NOTE

When a stock numbered item is requisitioned, the repair part received may have a different reference number than the part being replaced.

(2) *Usable on Code.* (Not Applicable.

d. Unit of Measure (U/M). Indicates the standard of the basic quantity of the listed item as used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr, etc.). When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

e. Quantity Incorporated in Unit. Indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for an assembly or subassembly. A "V" appearing in this column in lieu of a quantity indicates that no specific quantity is applicable. (e.g. shims, spacers, etc.).

f. Thirty-Day DS/GS Maintenance Allowances. (Not Applicable)

g. One-Year Allowance Per 100 Equipments/Contingency Planning Purposes. (Not Applicable)

h. Depot Maintenance Allowance Per 100 Equipments. (Not Applicable)

i. Illustration. This column is divided as follows:

(1) *Figure Number.* Indicates the figure number of the illustration in which the item is shown.

(2) *Item Number.* The number used to identify each item called out in the illustration.

C-4. Special Information.

Action change codes indicated in the left-hand margin of the listing page denote the following:

N—Indicates an added item
C—Indicates a change in data
R—Indicates a change in FSN only

C-5. How to Locate Repair Parts.

a. When Federal Stock Number or reference number is unknown:

(1) *First.* Using the table of contents, determine the assembly or subassembly within which the repair part belongs. This is necessary since illustrations are prepared for assemblies or subassemblies, and listings are divided into the same assemblies.

(2) *Second.* Find the illustration covering the assembly or subassembly to which the repair part belongs.

(3) *Third.* Identify the repair part on the illustration and note the illustration figure and item number of the repair part.

(5) *Fourth.* Using the Repair Parts Listing, find the figure and item number noted on the illustration.

b. When Federal stock number or reference number is known:

(1) *First.* Using the index of Federal stock numbers and reference numbers, find the pertinent Federal stock number or reference number. This index is in ascending FSN sequence followed by a list of reference numbers in ascending alphanumeric sequence, cross-referenced to the illustration figure and item number.

(2) *Second.* After finding the figure and item number, locate the figure and item number in the repair parts list.

C–6. Abbreviations. (Not Applicable)

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REFERENCE NUMBER & MFR CODE			USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30-DAY DS (D) MAINT ALW (A)-1-25 (B)-26-50 (C)-51-100	(7) ITEM NUMBER OR EQUIP ON TAGS	(8) DEPOT MAINT NUMBER OR EQUIP	(9) ILLUSTRATION (A) FIG NO	(B) ITEM NO
	4920-673-5514	BH112JA36	98869	TESTER,EXHAUST GAS TEMPERATURE...							1-1	
				SECTION II REPAIR PARTS LIST TEST CABLES AND CONNECTORS								
R	PBFZZ	4920-503-1889	BH405	98869	CABLE ASSEMBLY,SPECIAL PURPOSE,.. ELECTRICAL-HEATER	EA	1				2-10	1
R	PBFZZ	4920-503-1890	BH450	98869	CABLE ASSEMBLY,SPECIAL PURPOSE,.. ELECTRICAL-CHECK	EA	1				2-10	2
	PBFZZ	4920-504-3191	BH499	98869	CABLE ASSEMBLY,POWER,ELECTRICAL-. INLET	EA	1				2-10	3
	PBFZZ	4920-548-7118	BH485	98869	CABLE ASSEMBLY,SPECIAL PURPOSE,.. ELECTRICAL-INSTRUMENT	EA	1				2-10	4
	PBFZZ	4920-338-2591	BH123-3	98869	SWITCH BOX.....	EA	1				2-10	5
C	PBFZZ	4920-670-9410	BH1504	98869	CABLE ASSEMBLY,SPECIAL PURPOSE,.. ELECTRICAL-CHECK	EA	1				2-10	6
	PBFZZ	4920-953-2370	BH4548	98869	CABLE ASSEMBLY,SPECIAL PURPOSE,.. ELECTRICAL-CHECK	EA	1				2-10	6
	PBFZZ	4920-549-6093	BH821	98869	CABLE ASSEMBLY,POWER,ELECTRICAL-. INSULATION CHECK	EA	1				2-10	7
	PBFZZ	4920-504-3192	BH823	98869	CABLE ASSEMBLY,POWER,ELECTRICAL-. RESISTANCE CHECK	EA	1				2-10	8
R	PBFZZ	4920-539-9260	BH822	98869	CABLE ASSEMBLY,SPECIAL PURPOSE,.. ELECTRICAL-EGT INDICATOR CHECK	EA	1				2-10	9
	PBFZZ	4920-204-6457	BH820	98869	CABLE ASSEMBLY,POWER,ELECTRICAL-. ROM CHECK	EA	1				2-10	10
	PBFZZ	4920-329-8294	BH361-8	98869	INTERCONNECTING BOX,CABLE.....	EA	1				2-10	11
	PBFZZ	4920-767-2672	BH492B3	98869	EXTENSION HANDLE.....	EA	1				2-10	12
					BOX ASSEMBLY							
			BH1726	98869	BOX ASSEMBLY,TESTER.....		1				3-1	
C	PBFZZ	4920-565-3702	BH727	98869	.SOCKET,PIVOT,HANDLE.....	EA	2				3-1	4
C	PBFZZ	5305-059-3559	MS51958-63	96906	.SCREW,MACHINE.....	EA	3				3-1	8
C	PBFZZ	5325-141-4003	GH4	72794	.EYELET,TURNLOCK FASTENER.....	EA	1				3-1	19
C	PBFZZ	5325-285-3371	S4-225	72794	.LOCKSPRING,TURNLOCK FASTENER....	EA	1				3-1	20
C	PBFZZ	5305-770-2379	MS51959-15	96906	.SCREW,MACHINE.....	EA	2				3-1	21
C	PBFZZ	5310-088-0551	MS21044N04	96906	.NUT,SELF-LOCKING,HEXAGON.....	EA	2				3-1	22
	PBFZZ	2530-966-2530	X8253	82457	.WHEEL,TESTER BOX.....	EA	2				3-1	26

	(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REFERENCE NUMBER & MFR CODE			USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30-DAY DS GS MAINT ALW (a) 1-20	(b) 21-50	(c) 51-100	(7) 1-YR ALWFER OF EQUIP ONTGCY	(8) DEPOT MAINT ALWFER 1Y EQUIP	(9) ILLUSTRATION (a) FIG NO	(b) ITEM NO
C	PBFZZ	5365-298-6563	MS16624-62	96906	.RING,RETAINING.....		EA	2						3-1	27
C	PBFZZ	4920-565-3714	BH835	98869	.WHEEL MOUNT,TESTER.....		EA	2						3-1	28
					HEATER PROBE										
	PBFZZ	4920-670-9379	BH996-40	98869	PROBE ASSEMBLY,HEATER.....		EA	3						3-2	2
					MAJOR COMPONENTS										
C	PBFZZ	5305-253-5503	MS21318-1	96906	SCREW,DRIVE.....		EA	4						4-6	2
			BH1740	98869	DECK ASSEMBLY,CONTROL.....			1						4-6	4
					SEE FIG.4-8 FOR BREAKDOWN										
C	PBFZZ	5305-958-5451	MS35190-239	96906	SCREW,MACHINE.....		EA	14						4-6	5
C	XBFZZ		BH824	98869	GASKET.....		EA	1						4-6	6
C	PBFZZ	6120-800-2482	W20	24655	TRANSFORMER,VARIABLE,POWER.....		EA	1						4-6	7
C	PBFZZ	5306-180-2778	AN4CH4A	88044	BOLT,MACHINE.....		EA	3						4-6	8
C	PBFZZ	5310-933-8121	MS35338-139	96906	WASHER,LOCK.....		EA	3						4-6	9
C	PBFZZ	5305-054-6651	MS51957-27	96906	SCREW,MACHINE.....		EA	1						4-6	11
C	PBFZZ	5310-616-3555	MS35333-71	96906	WASHER,LOCK.....		EA	1						4-6	12
C	PBFZZ	5305-054-6651	MS51957-27	96906	SCREW,MACHINE.....		EA	1						4-6	14
C	PBFZZ	5310-616-3555	MS35333-71	96906	WASHER,LOCK.....		EA	1						4-6	15
C	PBFZZ	4920-734-8314	BH1766	98869	PRINTED CIRCUIT BOARD,WITH CABLE..		EA	1						4-6	16
					SEE FIG.4-7 FOR BREAKDOWN										
C	XBFZZ		MS51957-46	96906	SCREW,MACHINE.....		EA	6						4-6	17
			BH1726	98869	BOX ASSEMBLY,TESTER.....			1						4-6	18
					SEE FIG.3-1 FOR BREAKDOWN										
					BH1766 CIRCUIT BOARD ASSEMBLY										
C	PBFZZ	4920-734-8314	BH1766	98869	PRINTED CIRCUIT BOARD,WITH CABLE..		EA	1						4-7	
C	XBFZZ		BH1768	98869	.CABLE,POWER.....		EA	1						4-7	1
R	PBHZZ	5961-852-2537	BH3717	98869	.SEMICONDUCTOR DEVICE,DIODE.....		EA	4						4-7	2
	PBHZZ	5961-953-5053	1N1530A	82260	.SEMICONDUCTOR DEVICE,DIODE.....		EA	1						4-7	3
C	PBHZZ	5961-082-4040	JAN1429	81349	.SEMICONDUCTOR DEVICE,DIODE.....		EA	6						4-7	4
	PBHZZ	5905-660-7830	BH1571	98869	.RESISTOR,FIXED,WIRE WOUND.....		EA	1						4-7	5
	PBHZZ	5905-660-7828	BH1569	98869	.RESISTOR,FIXED,WIRE WOUND.....		EA	1						4-7	6
C	PBHZZ	5910-010-4884	M39006-09-6543	81349	.CAPACITOR,FIXED.....		EA	3						4-7	7

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REFERENCE NUMBER & MFR CODE			USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30-DAY DS GS MAINT ALW (a) 1-20	(b) 21-50	(c) 51-100	(7) ILW ALWFER AT EQUIP ONTOCK	(8) DEPOT MAINT ALWFER IN EQUIP	(9) ILLUSTRATION (a) FIG NO	(b) ITEM NO
	PBHZZ	5905-660-7840	BH1780	98869	.RESISTOR,FIXED,WIRE WOUND.....	EA	2						4-7	8
	PBHZZ	5905-660-7829	BH1570	98869	.RESISTOR,FIXED,WIRE WOUND.....	EA	1						4-7	9
C	XBHZZ		1N485	99180	.SEMICONDUCTOR DEVICE,DIODE.....	EA	2						4-7	10
	PBHZZ	5950-686-0789	BH1785	98869	.TRANSFORMER,POWER,STEP-DOWN..... AND STEP-UP	EA	1						4-7	11
C	PAHZZ	5920-284-9220	FO2B250V1A	81349	.FUSE,CARTRIDGE.....	EA	1						4-7	13
	PBHZZ	5905-660-7841	BH1781	98869	.RESISTOR,FIXED,WIRE WOUND.....	EA	1						4-7	14
	PBHZZ	5905-660-7842	BH1782	98869	.RESISTOR,FIXED,WIRE WOUND.....	EA	1						4-7	15
	PBHZZ	5905-502-2838	BH806	98869	.RESISTOR,FIXED,WIRE WOUND.....	EA	1						4-7	16
	PBHZZ	5905-502-2841	BH804	98869	.RESISTOR,FIXED,WIRE WOUND.....	EA	1						4-7	17
	PBHZZ	5905-502-2839	BH805	98869	.RESISTOR,FIXED,WIRE WOUND.....	EA	1						4-7	18
	PBHZZ	5905-533-5324	BH1185	98869	.RESISTOR,FIXED,WIRE WOUND.....	EA	1						4-7	19
	PBHZZ	5905-739-7789	BH755	98869	.RESISTOR,FIXED,WIRE WOUND.....	EA	1						4-7	20
C	XBHZZ		BH5033	98869	.RESISTOR,FIXED,WIRE WOUND.....	EA	1						4-7	21
C	PBHZZ	5310-811-3494	MS21044N08	96906	.NUT,SELF-LOCKING,HEXAGON.....	EA	4						4-7	22
					DECK ASSEMBLY									
			BH1740	98869	DECK ASSEMBLY,CONTROL.....		1						4-8	
C	PBFZZ	5305-054-6551	MS51957-27	96906	.SCREW,MACHINE.....	EA	5						4-8	3
C	PBFZZ	5310-616-3555	MS35333-71	96906	.WASHER,LOCK.....	EA	5						4-8	4
C	PBFZZ	5305-054-6551	MS51957-27	96906	.SCREW,MACHINE.....	EA	6						4-8	6
C	PBFZZ	5310-616-3555	MS35333-71	96906	.WASHER,LOCK.....	EA	6						4-8	7
	PBFZZ	5930-682-9237	BH1752	98869	.SWITCH,ROTARY.....	EA	1						4-8	10
C	PBFZZ	5930-539-7013	M5423-02-01	81349	.BOOT,DUST AND MOISTURE SEAL.....	EA	1						4-8	11
C	PBFZZ	5355-284-5184	1475	72512	.KNOB.....	EA	3						4-8	12
	PBHZZ	5905-683-1835	BH1724	98869	.RESISTOR,VARIABLE,LINEAR..... PRECISION	EA	1						4-8	13
C	PBFZZ	5930-823-0482	M5423-09-02	81349	.BOOT,DUST AND MOISTURE SEAL.....	EA	1						4-8	14
	PBFZZ	5930-699-5704	BH815	98869	.SWITCH,ROTARY.....	EA	2						4-8	16
	PBFZZ	5930-823-0482	M5423-09-02	81349	.BOOT,DUST AND MOISTURE SEAL.....	EA	2						4-8	17
C	PBFZZ	5355-284-5184	1475	72512	.KNOB.....	EA	1						4-8	18
	PBFZZ	5905-679-3250	BH1926-1	98869	.POTENTIOMETER,SLIDE WIRE.....	EA	1						4-8	19
C	PBFZZ	5305-054-5647	MS51957-13	96906	.SCREW,MACHINE.....	EA	4						4-8	20
C	PBFZZ	5310-088-0551	MS21044N04	96906	.NUT,SELF-LOCKING,HEXAGON.....	EA	2						4-8	26
N	PBFZZ	5330-260-9311	AN6227-5	88044	.PACKING,PREFORMED.....	EA	1						4-8	27
	PBFZZ	6625-539-9153	BH951	98869	.GALVANOMETER.....	EA	1						4-8	29
C	PBFZZ	5305-054-5551	MS51957-17	96906	.SCREW,MACHINE.....	EA	6						4-8	30
C	PBFZZ	5310-088-0551	MS21044N04	96906	.NUT,SELF-LOCKING,HEXAGON.....	EA	6						4-8	31
	PBFZZ	5930-682-9238	BH1751	98869	.SWITCH,ROTARY.....	EA	1						4-8	34
C	PBFZZ	5930-823-0482	M5423-09-02	81349	.BOOT,DUST AND MOISTURE SEAL.....	EA	1						4-8	35
	PBFZZ	5930-685-9995	BH1753	98869	.SWITCH,ROTARY.....	EA	1						4-8	37
C	PBFZZ	5930-823-0482	M5423-09-02	81349	.BOOT,DUST AND MOISTURE SEAL.....	EA	1						4-8	38
	PBFZZ	6625-600-1920	BH819A	98869	.METER,OHMMETER.....	EA	1						4-8	39
C	PBFZZ	5305-054-6555	MS51957-31	96906	.SCREW,MACHINE.....	EA	3						4-8	40
C	PBFZZ	5310-616-3555	MS35333-71	96906	.WASHER,LOCK.....	EA	3						4-8	41
C	PBFZZ	5310-081-8087	MS21044N06	96906	.NUT,SELF-LOCKING,HEXAGON.....	EA	3						4-8	42

(1)	(2)	(3) DESCRIPTION			USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30-DAY DS GS MAINT ALW (a) 1-20	(b) 21-50	(c) 51-100	(7) 1 YR ALWPER DX EQUIP CNTGCY	(8) DEPOT MAINT ALWPER DX EQUIP	(9) ILLUSTRATION (a) FIG NO	(b) ITEM NO
SMR CODE	FEDERAL STOCK NUMBER	REFERENCE NUMBER & MFR CODE												
C	PBFZZ	5305-054-6650	MS51957-26	96906	.SCREW,MACHINE.....	EA	4						4-8	47
C	PBFZZ	5310-616-3555	MS35333-71	96906	.WASHER,LOCK.....	EA	4						4-8	48
			BH1760	98869	.PRINTED CIRCUIT BOARD ASSEMBLY. SEE FIG.4-10 FOR BREAKDOWN		1						4-8	49
C	PBFZZ	5310-616-3555	MS35333-71	96906	.WASHER,LOCK.....	EA	4						4-8	51
C	PBFZZ	5310-081-8087	MS21044N06	96906	.NUT,SELF-LOCKING,HEXAGON.....	EA	4						4-8	52
			BH146	98869	.RPM CHECK ASSEMBLY..... SEE FIG.4-9 FOR BREAKDOWN		1						4-8	54
C	PBFZZ	5930-823-0482	M5423-09-02	81349	.BOOT,DUST AND MOISTURE SEAL....	EA	1						4-8	56
C	PBFZZ	5305-054-6650	MS51957-26	96906	.SCREW,MACHINE.....	EA	7						4-8	57
C	PBFZZ	5310-088-0551	MS21044N04	96906	.NUT,SELF-LOCKING,HEXAGON.....	EA	10						4-8	58
C	PBFZZ	5310-616-3555	MS35333-71	96906	.WASHER,LOCK.....	EA	7						4-8	59
C	PBFZZ	5355-284-5184	1475	72512	.KNOB.....	EA	1						4-8	60
	PBFZZ	5905-565-3695	BH1494	98869	.POTENTIOMETER.....	EA	1						4-8	61
C	PBFZZ	5305-054-6650	MS51957-26	96906	.SCREW,MACHINE.....	EA	4						4-8	62
C	PBFZZ	5310-616-3555	MS35333-71	96906	.WASHER,LOCK.....	EA	4						4-8	63
C	PBFZZ	5310-088-0551	MS21044N04	96906	.NUT,SELF-LOCKING,HEXAGON.....	EA	2						4-8	67
N	PBFZZ	5330-260-9311	AN6227-5	88044	.PACKING,PREFORMED.....	EA	1						4-8	68
	PBFZZ	6625-626-3499	BH950A	98869	.GALVANOMETER.....	EA	1						4-8	69
C	PBFZZ	5310-088-0551	MS21044N04	96906	.NUT,SELF-LOCKING,HEXAGON.....	EA	6						4-8	71
	PAFZZ	5920-953-5039	MBO-2	98869	.FUSE.....	EA	1						4-8	74
	PAFZZ	5920-953-5037	MBO-20	98869	.FUSE.....	EA	1						4-8	75
C	PAFZZ	6240-155-7857	MS25237-328	96906	.LAMP,INCANDESCENT.....	EA	1						4-8	77
C	PBFZZ	5305-054-6650	MS51957-26	96906	.SCREW,MACHINE.....	EA	4						4-8	80
C	PBFZZ	5310-616-3555	MS35333-71	96906	.WASHER,LOCK.....	EA	4						4-8	81
C	PBFZZ	5310-088-0551	MS21044N04	96906	.NUT,SELF-LOCKING,HEXAGON.....	EA	4						4-8	84
C	PBFZZ	5935-137-4671	MS25043-16D	96906	.COVER,ELECTRICAL CONNECTOR.....	EA	1						4-8	85
C	PBFZZ	5305-054-5646	MS51957-12	96906	.SCREW,MACHINE.....	EA	1						4-8	86
C	PBFZZ	5330-292-3958	10-36675-16	77820	.GASKET.....	EA	1						4-8	87
C	PBFZZ	5305-054-6650	MS51957-26	96906	.SCREW,MACHINE.....	EA	4						4-8	90
C	PBFZZ	5310-616-3555	MS35333-71	96906	.WASHER,LOCK.....	EA	4						4-8	91
C	PBFZZ	5310-083-0551	MS21044N04	96906	.NUT,SELF-LOCKING,HEXAGON.....	EA	4						4-8	94
C	PBFZZ	5935-257-7581	MS25043-14C	96906	.COVER,ELECTRICAL CONNECTOR.....	EA	1						4-8	95
C	PBFZZ	5305-054-5646	MS51957-12	96906	.SCREW,MACHINE.....	EA	1						4-8	96
C	PAFZZ	5930-655-1582	MS35059-23	96906	.SWITCH,TOGGLE.....	EA	1						4-8	98
C	PBFZZ	5930-539-7013	M5423-02-01	81349	.BOOT,DUST AND MOISTURE SEAL....	EA	1						4-8	99
C	PBFZZ	5305-054-6650	MS51957-26	96906	.SCREW,MACHINE.....	EA	4						4-8	102
C	PBFZZ	5310-616-3555	MS35333-71	96906	.WASHER,LOCK.....	EA	4						4-8	103
C	PBFZZ	5310-088-0551	MS21044N04	96906	.NUT,SELF-LOCKING,HEXAGON.....	EA	4						4-8	106
C	PBFZZ	5935-257-7581	MS25043-14C	96906	.COVER,ELECTRICAL CONNECTOR.....	EA	1						4-8	107
C	PBFZZ	5305-054-5646	MS51957-12	96906	.SCREW,MACHINE.....	EA	2						4-8	108
C	PBFZZ	5305-054-6650	MS51957-26	96906	.SCREW,MACHINE.....	EA	8						4-8	112
C	PBFZZ	5310-616-3555	MS35333-71	96906	.WASHER,LOCK.....	EA	8						4-8	113
C	PBFZZ	5310-088-0551	MS21044N04	96906	.NUT,SELF-LOCKING,HEXAGON.....	EA	8						4-8	116
C	PBFZZ	5935-578-9536	MS25043-12C	96906	.COVER,ELECTRICAL CONNECTOR.....	EA	2						4-8	117
C	PBFZZ	5305-054-5646	MS51957-12	96906	.SCREW,MACHINE.....	EA	2						4-8	118
C	PBFZZ	5310-088-0551	MS21044N04	96906	.NUT,SELF-LOCKING,HEXAGON.....	EA	2						4-8	122
C	PBFZZ	5330-350-9013	AN6227-10	88044	.PACKING,PREFORMED.....	EA	1						4-8	123
C	PBFZZ	5305-071-1320	MS51960-63	96906	.SCREW,MACHINE.....	EA	4						4-8	126
C	PBFZZ	4920-800-4131	BH1744	98869	.DECK,MACHINED.....	EA	1						4-8	128

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REFERENCE NUMBER & MFR CODE			USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30-DAY DS GS MAINT ALW (A) 1-20	(B) 21-50	(C) 51-100	(7) LVR ALWNCE BY EQUIP ON HOOK	(8) DEPOT MAINT ALWNCE BY EQUIP	(9) ILLUSTRATION (A) FIG NO	(B) ITEM NO
				RPM CHECK ASSEMBLY										
		BH146	98869	RPM CHECK ASSEMBLY			1						4-9	
PBHZZ	5945-673-1720	BH1498	98869	.RELAY,ARMATURE		EA	1						4-9	1
C PBFZZ	5960-272-9182	6X4WA	81349	.ELECTRON TUBE		EA	1						4-9	3
C XBFZZ		OA2	98869	.ELECTRON TUBE		EA	1						4-9	4
C PBFZZ	5960-669-8921	12BH7A	80131	.ELECTRON TUBE		EA	1						4-9	6
PBHZZ	5950-646-5586	BH1401	98869	.TRANSFORMER,POWER,STEP-DOWN.... AND STEP-UP		EA	1						4-9	10
C PBHZZ	5310-081-8087	MS21044N06	96906	.NUT,SELF-LOCKING,HEXAGON		EA	4						4-9	11
PBFZZ	5930-552-1143	BH1486	98869	.SWITCH,ROTARY		EA	1						4-9	12
C PBHZZ	5905-660-3641	RA20LASB501A	81349	.RESISTOR,VARIABLE,WIRE WOUND		EA	1						4-9	14
C PBHZZ	5905-681-1197	RA20LASB102A	81349	.RESISTOR,VARIABLE,WIRE WOUND		EA	1						4-9	15
C XBHZZ		B0310	98869	.CONDENSER		EA	1						4-9	16
C PBHZZ	5305-054-5647	MS51957-13	96906	.SCREW,MACHINE		EA	2						4-9	17
C PBHZZ	5310-088-0551	MS21044N04	96906	.NUT,SELF-LOCKING,HEXAGON		EA	2						4-9	18
		BH1479	98869	.TERMINAL BOARD ASSEMBLY..... SEE FIG.4-13 FOR BREAKDOWN			1						4-9	20
		BH1475	98869	.TERMINAL BOARD ASSEMBLY..... SEE FIG.4-13 FOR BREAKDOWN			1						4-9	22
C XBHZZ		9718	98869	.SOCKET,ELECTRON TUBE		EA	1						4-9	23
C PBHZZ	5305-054-6651	MS51957-27	96906	.SCREW,MACHINE		EA	4						4-9	24
C PBHZZ	5310-081-8087	MS21044N06	96906	.NUT,SELF-LOCKING,HEXAGON		EA	4						4-9	25
C PBHZZ	5935-891-1470	77MIP8	02660	.SOCKET,ELECTRON TUBE		EA	1						4-9	26
C PBHZZ	5305-054-5647	MS51957-13	96906	.SCREW,MACHINE		EA	2						4-9	28
C PBHZZ	5310-088-0551	MS21044N04	96906	.NUT,SELF-LOCKING,HEXAGON		EA	2						4-9	29
C PBFZZ	5325-263-6632	MS35489-6	96906	.GROMMET,RUBBER		EA	3						4-9	30
				BH1760 CIRCUIT BOARD ASSEMBLY										
		BH1760	98869	PRINTED CIRCUIT BOARD ASSEMBLY			1						4-10	
PBHZZ	5905-865-7320	BH275	98869	.RESISTOR,FIXED,WIRE WOUND		EA	1						4-10	1
PBHZZ	5905-865-7319	BH274	98869	.RESISTOR,FIXED,WIRE WOUND		EA	1						4-10	2
C XBHZZ		BH1770	98869	.RESISTOR,FIXED,WIRE WOUND		EA	1						4-10	3
C XBHZZ		BH1771	98869	.RESISTOR,FIXED,WIRE WOUND		EA	1						4-10	4
C PBHZZ	5905-837-0047	301-00-20K	94271	.RESISTOR,VARIABLE		EA	3						4-10	5
C PBHZZ	5905-998-2257	301-00-1K	94271	.RESISTOR,VARIABLE		EA	1						4-10	6
C PBHZZ	5905-740-7932	301-00-50	79318	.RESISTOR,VARIABLE		EA	1						4-10	7
PBHZZ	5905-660-7835	BH1774	98869	.RESISTOR,FIXED,WIRE WOUND		EA	1						4-10	8
PBHZZ	5905-660-7836	BH1775	98869	.RESISTOR,FIXED,WIRE WOUND		EA	2						4-10	9
PBHZZ	5905-660-7837	BH1776	98869	.RESISTOR,FIXED,WIRE WOUND		EA	1						4-10	10
C XBHZZ		BH1777	98869	.RESISTOR,FIXED,WIRE WOUND		EA	1						4-10	11
PBHZZ	5905-660-7834	BH1773	98869	.RESISTOR,FIXED,WIRE WOUND		EA	1						4-10	12

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REFERENCE NUMBER & MFR CODE			USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30-DAY DS GS MAINT ALW (a) 1-20	(b) 21-50	(c) 51-100	(7) 1YR ALWFR QTY EQUIP ON HAND	(8) DEPOT MAINT ALWFR QTY EQUIP	(9) ILLUSTRATION (a) FIG NO	(b) ITEM NO
C	XBHZZ		BH1778	98869	.RESISTOR,FIXED,WIRE WOUND.....	EA	1						4-10	13
	PBHZZ	5905-660-7833	BH1772	98869	.RESISTOR,FIXED,WIRE WOUND.....	EA	1						4-10	14
					TERMINAL BOARD ASSEMBLIES									
			BH1479	98869	TERMINAL BOARD ASSEMBLY.....		1						4-13	
C	PBHZZ	5905-104-5756	RCR20G105JS	81349	.RESISTOR,FIXED,COMPOSITION.....	EA	1						4-13	1
C	PBHZZ	5910-758-4611	CQ09A1KC104J3	81349	.CAPACITOR,FIXED.....	EA	2						4-13	2
C	PBHZZ	5905-104-8346	RCR20G334JS	81349	.RESISTOR,FIXED,COMPOSITION.....	EA	1						4-13	3
C	PBHZZ	5905-171-2000	RC20GF684J	81349	.RESISTOR,FIXED,COMPOSITION.....	EA	1						4-13	4
C	XBHZZ		L10T1	98869	.CONDENSER.....	EA	1						4-13	5
C	XBHZZ		BH1433	98869	.RESISTOR,FIXED,WIRE WOUND.....	EA	1						4-13	7
	PBHZZ	5910-953-5055	BH1499	98869	.CONDENSER.....	EA	1						4-13	8
C	PBHZZ	5905-104-8336	RCR20G104JS	81349	.RESISTOR,FIXED,COMPOSITION.....	EA	1						4-13	9
			BH1475	98869	TERMINAL BOARD ASSEMBLY.....		1						4-13	
C	XBHZZ		BH1477	98869	.RESISTOR.....	EA	1						4-13	15
C	XBHZZ		BH1431	98869	.RESISTOR,FIXED,WIRE WOUND.....	EA	1						4-13	16
C	XBHZZ		BH1423	98869	.RESISTOR,FIXED,WIRE WOUND.....	EA	1						4-13	17
C	XBHZZ		BH1476	98869	.RESISTOR,FIXED,WIRE WOUND.....	EA	1						4-13	18
C	PBHZZ	5910-615-4865	BH1478	98869	.CAPACITOR,FIXED,MICA DIELECTRIC,	EA	1						4-13	19
C	PBHZZ	5905-141-1168	RCR20G222JS	81349	.RESISTOR,FIXED,COMPOSITION.....	EA	1						4-13	20
					SECTION III SPECIAL TOOLS LIST (NOT APPLICABLE)									

SECTION IV
FEDERAL STOCK NUMBER AND REFERENCE NUMBER INDEX

STOCK NUMBER	FIGURE NUMBER	ITEM NUMBER	STOCK NUMBER	FIGURE NUMBER	ITEM NUMBER
2530-966-2530	3-1	26	5310-616-3555	4-8	48
4920-204-6457	2-10	10	5310-616-3555	4-8	51
4920-329-8294	2-10	11	5310-616-3555	4-8	59
4920-338-2591	2-10	5	5310-616-3555	4-8	63
4920-503-1889	2-10	1	5310-616-3555	4-8	81
4920-503-1890	2-10	2	5310-616-3555	4-8	91
4920-504-3191	2-10	3	5310-616-3555	4-8	103
4920-504-3192	2-10	8	5310-616-3555	4-8	113
4920-539-9260	2-10	9	5310-811-3494	4-7	22
4920-548-7118	2-10	4	5310-933-8121	4-6	9
4920-549-6093	2-10	7	5325-141-4003	3-1	19
4920-555-3702	3-1	4	5325-263-6532	4-1	30
4920-565-3714	3-1	28	5325-285-3371	3-1	20
4920-670-9379	3-2	2	5330-260-9311	4-E	27
4920-670-9410	2-10	6	5330-260-9311	4-E	63
4920-734-8314	4-6	16	5330-292-3958	4-8	87
4920-734-8314	4-7		5330-350-9013	4-8	123
4920-767-2672	2-10	12	5355-284-5184	4-8	12
4920-800-4130	4-8	128	5355-284-5184	4-8	18
4920-953-2370	2-10	6	5355-284-5184	4-8	60
5305-054-5646	4-8	86	5365-298-6563	3-1	27
5305-054-5646	4-8	96	5905-104-5756	4-13	1
5305-054-5646	4-8	108	5905-104-8336	4-13	9
5305-054-5646	4-8	118	5905-104-8346	4-13	3
5305-054-5647	4-8	20	5905-141-1163	4-13	20
5305-054-5647	4-9	17	5905-171-2000	4-13	4
5305-054-5647	4-9	28	5905-502-2838	4-7	16
5305-054-5651	4-8	30	5905-502-2839	4-7	18
5305-054-6650	4-8	47	5905-502-2841	4-7	17
5305-054-6650	4-8	57	5905-538-5324	4-7	19
5305-054-6650	4-8	62	5905-565-3695	4-8	61
5305-054-6650	4-8	80	5905-660-3641	4-9	14
5305-054-6650	4-8	90	5905-660-7828	4-7	6
5305-054-6650	4-8	102	5905-660-7829	4-7	9
5305-054-6650	4-8	112	5905-660-7830	4-7	5
5305-054-6651	4-6	11	5905-660-7833	4-13	14
5305-054-6651	4-6	14	5905-660-7834	4-10	12
5305-054-6651	4-8	3	5905-660-7835	4-10	8
5305-054-6651	4-8	6	5905-660-7836	4-10	9
5305-054-6651	4-9	24	5905-660-7837	4-10	10
5305-054-6651	4-8	40	5905-660-7840	4-7	8
5305-059-3659	3-1	8	5905-660-7841	4-7	14
5305-071-1320	4-8	126	5905-660-7842	4-7	15
5305-253-5603	4-6	2	5905-679-3250	4-8	19
5305-770-2579	3-1	21	5905-681-1197	4-9	15
5305-953-5451	4-6	5	5905-683-1835	4-8	13
5306-180-2778	4-6	8	5905-739-7789	4-7	20
5310-031-8087	4-8	42	5905-740-7932	4-10	7
5310-081-8087	4-8	52	5905-837-0047	4-10	5
5310-081-8087	4-9	11	5905-865-7319	4-10	2
5310-081-8087	4-9	25	5905-865-7320	4-10	1
5310-086-0551	3-1	22	5905-993-2257	4-13	6
5310-088-0551	4-8	26	5910-010-4884	4-7	7
5310-088-0551	4-8	31	5910-615-4855	4-13	19
5310-088-0551	4-8	58	5910-758-4611	4-13	2
5310-088-0551	4-8	67	5910-953-5055	4-13	8
5310-088-0551	4-8	71	5920-284-9220	4-7	13
5310-088-0551	4-8	84	5920-953-5037	4-8	75
5310-088-0551	4-8	94	5920-953-5039	4-8	74
5310-088-0551	4-8	106	5930-539-7013	4-8	11
5310-088-0551	4-8	116	5930-539-7013	4-8	99
5310-088-0551	4-8	122	5930-552-1143	4-9	12
5310-088-0551	4-9	18	5930-655-1582	4-8	98
5310-088-0551	4-9	29	5930-682-9237	4-8	10
5310-616-3555	4-6	12	5930-682-9238	4-8	34
5310-616-3555	4-6	15	5930-685-9995	4-8	37
5310-616-3555	4-8	4	5930-699-5704	4-8	16
5310-616-3555	4-8	7	5930-823-0482	4-8	14
5310-616-3555	4-8	41	5930-823-0482	4-8	17

SECTION IV (CONTINUED)

STOCK NUMBER	FIGURE NUMBER	ITEM NUMBER	STOCK NUMBER	FIGURE NUMBER	ITEM NUMBER
5930-823-0482	4-8	35	5960-272-9182	4-9	3
5930-823-0482	4-8	38	5960-659-8921	4-9	6
5930-823-0482	4-8	56	5961-082-4040	4-7	4
5935-137-4671	4-8	85	5961-852-2537	4-7	2
5935-257-7581	4-8	95	5961-953-5053	4-7	3
5935-257-7581	4-8	107	6120-800-2482	4-6	7
5935-578-9536	4-8	117	6240-155-7857	4-8	77
5935-891-1470	4-9	26	6625-539-9153	4-8	29
5945-673-1720	4-9	1	6625-600-1920	4-8	39
5950-646-5585	4-9	10	6625-626-3499	4-8	69
5950-686-0789	4-7	11			

SECTION IV (CONTINUED)

REFERENCE NUMBER	MFG CODE	FIG NUMBER	ITEM NUMBER	REFERENCE NUMBER	MFG CODE	FIG NUMBER	ITEM NUMBER
AN4CH4A	88044	4-6	8	BH805	98869	4-7	18
AN6227-10	88044	4-8	123	BH806	98869	4-7	16
AN6227-5	88044	4-8	27	BH815	98869	4-8	16
AN6227-5	88044	4-8	63	BH819A	98869	4-8	39
BH1185	98869	4-7	19	BH820	98869	2-10	10
BH123-3	98869	2-10	5	BH821	98869	2-10	7
BH1401	98869	4-9	10	BH822	98869	2-10	9
BH1428	98869	4-13	17	BH823	98869	2-10	8
BH1431	98869	4-13	16	BH824	98869	4-6	6
BH1433	98869	4-13	7	BH835	98869	3-1	28
BH146	98869	4-8	54	BH950A	98869	4-9	69
BH146	98869	4-9		BH951	98869	4-8	29
BH1475	98869	4-9	22	BH996-40	98869	3-2	2
BH1475	98869	4-13		B0310	98869	4-9	16
BH1476	98869	4-13	18	CQ06A1KC104J3	81349	4-13	2
BH1477	98869	4-13	15	F02B250V1A	81349	4-7	13
BH1478	98869	4-13	19	GM4	72794	3-1	19
BH1479	98869	4-9	23	JAN1N429	81349	4-7	4
BH1479	98869	4-13		L10T1	98869	4-13	5
BH1486	98869	4-9	12	MB0-2	98869	4-8	74
BH1494	98869	4-8	61	MB0-20	98869	4-8	75
BH1498	98869	4-9	1	MS16624-62	96906	3-1	27
BH1499	98869	4-13	8	MS21044N04	96906	3-1	22
BH1504	98869	2-10	6	MS21044N04	96906	4-8	26
BH1569	98869	4-7	6	MS21044N04	96906	4-8	31
BH1570	98869	4-7	9	MS21044N04	96906	4-8	58
BH1571	98869	4-7	5	MS21044N04	96906	4-8	67
BH1724	98869	4-8	13	MS21044N04	96906	4-8	71
BH1726	98869	3-1		MS21044N04	96906	4-8	84
BH1726	98869	4-6	18	MS21044N04	96906	4-8	94
BH1740	98869	4-6	4	MS21044N04	96906	4-8	106
BH1740	98869	4-8		MS21044N04	96906	4-8	116
BH1744	98869	4-8	128	MS21044N04	96906	4-8	122
BH1751	98869	4-9	34	MS21044N04	96906	4-9	18
BH1752	98869	4-8	10	MS21044N04	96906	4-9	29
BH1753	98869	4-8	37	MS21044N06	96906	4-8	42
BH1760	98869	4-8	49	MS21044N06	96906	4-8	52
BH1760	98869	4-10		MS21044N06	96906	4-9	11
BH1766	98869	4-6	16	MS21044N06	96906	4-9	25
BH1766	98869	4-7		MS21044N08	96906	4-7	22
BH1768	98869	4-7	1	MS21318-1	96906	4-6	2
BH1770	98869	4-10	3	MS25043-12C	96906	4-8	117
BH1771	98869	4-10	4	MS25043-14C	96906	4-8	95
BH1772	98869	4-10	14	MS25043-14C	96906	4-8	107
BH1773	98869	4-10	12	MS25043-16D	96906	4-8	85
BH1774	98869	4-10	8	MS25237-328	96906	4-8	77
BH1775	98869	4-10	9	MS35059-23	96906	4-8	98
BH1776	98869	4-10	10	MS35190-239	96906	4-6	5
BH1777	98869	4-10	11	MS35333-71	96906	4-6	12
BH1778	98869	4-10	13	MS35333-71	96906	4-6	15
BH1780	98869	4-7	8	MS35333-71	96906	4-8	4
BH1781	98869	4-7	14	MS35333-71	96906	4-8	7
BH1782	98869	4-7	15	MS35333-71	96906	4-8	41
BH1785	98869	4-7	11	MS35333-71	96906	4-8	48
BH192B-1	98869	4-8	19	MS35333-71	96906	4-8	51
BH274	98869	4-10	2	MS35333-71	96906	4-8	59
BH275	98869	4-10	1	MS35333-71	96906	4-8	63
BH361-8	98869	2-8	11	MS35333-71	96906	4-8	81
BH3717	98869	4-7	2	MS35333-71	96906	4-8	91
BH405	98869	2-10	1	MS35333-71	96906	4-8	103
BH450	98869	2-10	2	MS35333-71	96906	4-8	113
BH454B	98869	2-10	6	MS35338-139	96906	4-6	9
BH485	98869	2-10	4	MS35489-6	96906	4-9	30
BH492B3	98869	2-10	12	MS51957-12	96906	4-8	86
BH499	98869	2-10	3	MS51957-12	96906	4-8	96
BH5033	98869	4-7	21	MS51957-12	96906	4-8	108
BH727	98869	3-1	4	MS51957-12	96906	4-8	118
BH755	98869	4-7	20	MS51957-13	96906	4-8	20
BH804	98869	4-7	17	MS51957-13	96906	4-9	17

SECTION IV (CONTINUED)

REFERENCE NUMBER	MFG CODE	FIG NUMBER	ITEM NUMBER
MS51957-13	96906	4-9	28
MS51957-17	96906	4-8	30
MS51957-26	96906	4-8	47
MS51957-26	96906	4-8	62
MS51957-26	96906	4-8	80
MS51957-26	96906	4-8	90
MS51957-26	96906	4-8	102
MS51957-26	96906	4-8	112
MS51957-27	96906	4-6	11
MS51957-27	96906	4-6	14
MS51957-27	96906	4-8	3
MS51957-27	96906	4-8	6
MS51957-27	96906	4-9	24
MS51957-31	96906	4-8	40
MS51957-46	96906	4-6	17
MS51958-63	96906	3-1	8
MS51959-15	96906	3-1	21
MS51960-63	96906	4-8	126
M39035-09-6543	81349	4-7	7
M5423-02-01	81349	4-8	11
M5423-02-01	81349	4-8	99
M5423-09-02	81349	4-8	14
M5423-09-02	81349	4-8	17
M5423-09-02	81349	4-8	35
M5423-09-02	81349	4-8	38
M5423-09-02	81349	4-8	56
RA20LASB102A	81349	4-9	15
RA20LASB501A	81349	4-9	14
RC20GF684J	81349	4-13	4
RCR20G104JS	81349	4-13	9
RCR20G105JS	81349	4-13	1
RCR20G222JS	81349	4-13	20
RCR20G334JS	81349	4-13	3
S4-225	72764	3-1	20
W20	24655	4-6	7
X8253	82457	3-1	26
0A2	98869	4-9	4
1N1530A	82260	4-7	3
1N485	99180	4-7	10
10-36675-16	77820	4-8	87
12BH7A	80131	4-9	6
1475	72512	4-8	12
1475	72512	4-8	18
1475	72512	4-8	60
301-00-1K	94271	4-10	6
301-00-20K	94271	4-10	5
301-00-50	79318	4-10	7
6X4WA	81349	4-9	3
77MIPB	02660	4-9	25
9718	98859	4-9	23

ALPHABETICAL INDEX

Subject	*Paragraph Figure, Table, Number*	*Page*
B		
Base Assembly		
Cleaning	4–31*c*	4–28
Description	4–31	4–28
Disassembly	4–31*b*	4–28
Inspection and Repair	4–31*d*	4–28
Installation	4–52*b*	4–37
Reassembly	4–52*a*	4–37
Removal	4–31*a*	4–28
C		
Connectors		
Installation	4–47*b*	4–35
Removal	4–26*a*	4–23
Consumable Materials	Table 1–1	1–3
Controls, Operator's	2–2	2–2
D		
Data Tabulated	1–6	1–2
Deck Assembly		
Description	4–32	4–29
Installation	4–32*b*	4–29
Removal	4–32*a*	4–29
E		
EGT Indicator Check	2–8	2–5
F		
Forms and Records	1–2	1–1
Functional Checks	3–13—3–16	3–6, 3–8
G		
Galvanometer (Galvo–1)		
Installation	4–41*b*	4–33
Removal	4–19*a*	4–19
Galvanometer (Galvo–2)		
Installation	4–41*b*	4–33
Removal	4–20*a*	4–19
H		
Handle Assembly		
Cleaning	4–30*c*	4–28

ALPHABETICAL INDEX—Continued

Subject	*Paragraph Figure, Table, Number*	*Page*
Handle Assembly—Continued		
Description	4–30	4–27
Inspection and Repair	4–30*d*	4–28
Installation	3–3*a*	3–1
I		
Identification	1–4	1–1
Instruments, Operator's	2–3	2–3
Insulation Check Meter		
Installation	4–43*b*	4–34
Removal	4–22*a*	4–19
L		
Limited Storage		
Inspection	4–6*a*	4–2
Preparation	4–5	4–2
Lubrication	3–10	3–6
M		
Maintenance Allocation Chart	Appendix B	B–1
O		
Operation		
Functional Check of Aircraft EGT Circuit	2–8	2–5
Operation Check of EGT and RPM	2–15	2–11
Preparation	2–5	2–3
Securing Tester	2–14	2–10
Troubleshooting EGT System	2–7	2–5
Operation Under Unusual Conditions	2–19—2–3	2–14, 2–3
P		
Potentiometer (°C)		
Installation	4–42*b*	4–34
Removal	4–21*a*	4–19
Potentiometer (R–i)		
Cleaning	4–23*c*	4–21
Description	4–23	4–21
Inspection and Testing	4–23*d*	4–21
Installation	4–44*b*	4–34
Removal	4–23*a*	4–21
Repair	4–23*e*	4–21
Potentiometer (% RPM)		
Installation	4–49*b*	4–36
Removal	4–28*a*	4–27
Preparation for Reshipment	4–8	4–2
Preparation for Storage	4–5	4–2
Preventive Maintenance	3–8	3–6
Printed Circuit Board Assembly, BH1760		
Alignment	4–40*b*	4–32
Cleaning	4–18*c*	4–17

ALPHABETICAL INDEX—Continued

Subject	*Paragraph Figure, Table, Number*	*Page*
Printed Circuit Board Assembly, BH1760—Continued		
Description	4-18	4-16
Disassembly	4-18*b*	4-16
Inspection and Testing	4-18*d*	4-17
Installation	4-40*c*	4-33
Removal	4-18*a*	4-16
Repair	4-18*e*	4-17
Printed Circuit Board Assembly and Cable, BH1766		
Cleaning	4-17*c*	4-11
Description	4-17	4-11
Disassembly	4-17*b*	4-11
Inspection and Testing	4-17*d*	4-11
Installation	4-39*b*	4-31
Reassembly	4-39*b*	4-31
Removal	4-17*a*	4-11
Repair	4-17*e*	4-11
Probe Storage Compartment		
Cleaning	4-29*c*	4-27
Description	4-29	4-27
Disassembly	4-29*b*	4-27
Inspection and Repair	4-29*d*	4-27
Reassembly	4-45*a*	4-34
R		
Reading Correct Engine RPM with RPM Check Circuit	2-15	2-11
References	Appendix A	A-1
Replacement of Fuses	4-35	4-30
Replacement of Galvanometer Lamps	4-33	4-30
Replacement of POWER ON Lamp	4-34	4-30
Replacement of RPM CHECK Tubes	4-36	4-30
RPM Check Assembly		
Alignment	4-43*b*	4-34
Cleaning	4-27*c*	4-24
Description	4-27	4-23
Disassembly	4-27*b*	4-23
Inspection and Testing	4-27*d*	4-24
Installation	4-48*c*	4-36
Removal	4-27*a*	4-23
Repair	4-27*e*	4-26
Rotary Switches		
Cleaning	4-24*c*	4-22
Description	4-24	4-22
Inspection and Testing	4-24*d*	4-22
Installation	4-45*b*	4-34
Removal	4-24*a*	4-22
Repair	4-24*e*	4-22
S		
Special Tools and Equipment	1-7	1-3

ALPHABETICAL INDEX—Continued

Subject	*Paragraph Figure, Table, Number*	*Page*
T		
Toggle Switches		
Cleaning	4-25*c*	4-23
Description	4-25	4-22
Inspection and Testing	4-25*d*	4-23
Installation	4-46*b*	4-34
Removal	4-25*a*	4-22
Troubleshooting, Direct Support and General Support	4-9—4-14	4-3, 4-7
Troubleshooting, Organizational	3-17	3-9
Unloading and Unpacking Equipment	3-2, 4-2	3-1, 4-1
V		
Voltage Regulator		
Cleaning	4-16*c*	4-11
Description	4-16	4-10
Disassembly	4-16*b*	4-11
Inspection and Repair	4-16*d*	4-11
Removal	4-38*b*	4-31
Installation	4-16*a*	4-11

By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Official:

VERNE L. BOWERS
Major General, United States Army,
The Adjutant General.

DISTRIBUTION:

To be distributed in accordance with DA Form 12–31 (qty rqr block no. 94) Organizational Maintenance Requirements for all Fixed and Rotor Wing Aircraft.

☆U.S. GOVERNMENT PRINTING OFFICE: 1989 - 234-100/00120